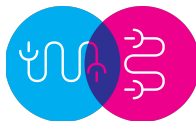


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D5.4 Summary of all the Pilots organised

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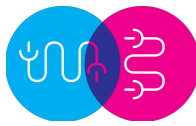


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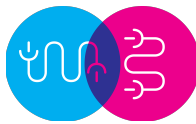
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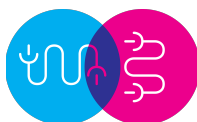
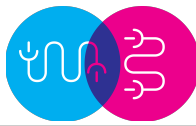


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Executive summary

The present document is a deliverable of the #MusicBricks project, funded by the European Commission's Directorate-General for Communications Networks, Content & Technology (DG CONNECT), under its Horizon 2020 research and innovation programme.

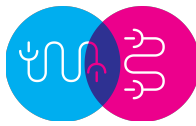
Four core project activity events were organised by the #MusicBricks project partners in order to disseminate the #MusicBricks toolset to the main target stakeholders and to allow for immediate and detailed observation and feedback on their use. This document provides summaries of the context, background, organisation and results of all of these Creative Testbed events.

The first Creative Testbed, #MTFScandi, which ran 28-30 May 2015 in Umeå, Sweden, gave the partners a clear indication of the power of #MusicBricks. With the focus on physical applications for music interaction and performance, creative developers were particularly incentivised to use the newly available #MusicBricks R-IoT microboard for motion sensing and motion analysis. A range of successful applications were produced, addressing different types of innovation: Smart Products for Smart Homes, new ways to communicate using mind and body, novel product platforms driven by motion sensors, and intelligent musical instruments. Creative developers were instructed and mentored throughout this process. At the end of the Creative Testbed, four prototypes were deemed by the judges to have creative and commercial potential and were chosen for incubation supported by #MusicBricks microfunding.

The R-IoT micro board for motion sensing and motion analysis proved extremely popular also at the Sonar +D Music Hack Day in Barcelona, 17-19 June 2015. All twelve available manufactured boards were reserved by teams right at the start of the Creative Testbed. This event also saw a higher uptake of the seven other #MusicBricks. The pre-event #MusicBricks workshop, run on the day preceding the 24-hour hackathon, proved very successful and contributed in great part to the developers' confidence in using all eight #MusicBricks. A special set of graphic symbols were designed especially to identify each #MusicBrick, and these were made available as stickers. This dissemination method proved extremely popular with many developers marking their laptops with the chosen #MusicBricks. Four further seed prototypes were chosen by the judges to be supported by #MusicBricks microfunding. These included an accessibility product, a collaborative musical performance, an action music interface and music AI.

The third #MusicBricks dissemination event, #MTFCentral, provided the opportunity to showcase the development of all eight #MusicBricks projects incubated thus far and to visibly illustrate the viability of the #MusicBricks platform. The event also provided the necessary environment for new #MusicBricks projects to be seeded through the #MTFCentral Hack Camp, with thirteen new potential product ideas, ranging from a program that grabs audio streams from cities around the world and turns them into a live stage performance to a modular analog instrument app intended for people with disabilities. From amongst these projects three further prototypes were chosen by the judges to be supported by #MusicBricks including an interactive lighting product, a dynamic musical dance floor and hand gesture recognition system for playing song parts.

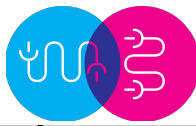
A bonus additional #MusicBricks Creative Testbed, the Waves Vienna Music Hack Day, saw 50 attendees taking part from a wide range of countries including 15 children. As with the previous Creative Testbeds the #MusicBricks toolset was presented to participants at the event for application during the Hackathon Challenges and #MusicBricks were selected by seven of the teams to form major building blocks for their designs. One of these seven projects, which used the #MusicBricks Transcriber to control light through sound, was consequently taken forward for incubation. The event proved highly successful allowing #MusicBricks partners to harvest further vital feedback and broker new disseminations amidst the enthusiasm and creativity of the participants.



1. Introduction

This document provides an overview of the organisation and outcome of the Creative Testbeds organised by the #MusicBricks partners and designed to seed creative ideas for new products and applications of the #MusicBricks toolset.

The document summarises the context, background and organisation of all four Creative Testbeds. It follows with the list of #MusicBricks technologies which have been made exclusively available to the creative developers through APIs, GUIs and TUIs. It then lists the methodologies deployed at the Creative Testbeds to incentivise and inspire the Creative Developers in the use of #MusicBricks, followed by a list of all notable resulting innovations.



2. Summary of Pilots Organised

This chapter summarises the background, organisation, methodologies and outcomes of all four WP5 events. Part of the information presented has already been included in D5.1 as an outline of the first two Creative Testbeds. We include this data here again, with additional information about the third and fourth WP5 events, so as to give a complete overview of all four Creative Testbed events.

2.1.#MTFScandi, Umeå, Sweden

2.1.1.About Music Tech Fest

Music Tech Fest launched in 2012 as a creative playground - a 'festival of music ideas' - in an attempt to bring all music tech creators and thinkers under one roof. The festival was a spinoff of the EU Roadmap for Music Information Research (MIReS) which aimed at opening up the scientific field of MIR to cultural, social and creative studies. Michela Magas, Scientific Director of MIReS and founder of the Music Tech Fest, brought artists and scientists as well as academia and industry into a common creative space. Through match funding and support from local organisations, MTF succeeded in showcasing 54 presenters, inventors and performers; 70 innovative hackers, makers and developers of novel instruments; and 70 creative practitioners and emerging artists.

In its second year (Music Tech Fest London, 17-19 May 2013) the event continued to explore the way that music is perceived, experienced and performed. It attracted the attention of all major music labels. Both mainstream and independent artists drew inspiration from the event to grow ideas with the music tech community and perform them at the following year's event. In its third year the event was invited to Wellington, Boston, London, Berlin and Paris by partners including the British Council, New Zealand Music Commission, Microsoft Research, London Symphony Orchestra, and IRCAM Centre Pompidou. The #MTFLondon event included a remote linkup from Berklee College of Music graduates in Boston in a 'telehackathon'; and also featured an MTF kids hackathon – in which 8-16 year-olds learned hands-on electronics and coding to make instruments which they performed on stage.

The festival also plays host to an academic symposium. At #MTFBoston, 21 top researchers from across a wide range of disciplines collaborated to produce the Manifesto for the Future of Music Technology Research in response to the Music Tech Fest experience, and the manifesto now bears hundreds of signatures. At #MTFLondon, a group of 42 musicians and researchers launched the research field of Human Music Interaction with a series of collaborative project proposals.

In 2015 the festival had 15 invitations by cities and organisations across the globe. However, organisers decided to instead stay in Europe to focus on two large regional festivals that would involve all of the creative community to think about new formats for music and new ways of combining different fields of knowledge in this space. #MTFScandi ran 29-31 May 2015 with the academic symposium on the 1st of June; #MTFCentral ran 18-20 September 2015, with the academic symposium on the 21st; and #MTFBerlin, where all the final #MusicBricks incubation results will be presented, will take place on 23-30 May 2016.

In order to establish a successful test ground, partner STRO established partnerships with the following organisations:

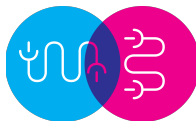
[4Sound](#)

[Ableton](#)

[B3 Media](#)

[Bare Conductive](#)

[Beer Studio](#)



[Costas Of Sweden](#)

[Drake Music](#)

[Electronic Sound](#)

[Farnell Element14](#)

[Guitars The Museum](#)

[HUMLab Umeå University](#)

[Infotech Umeå](#)

[Jays](#)

[Kultur Verket](#)

[Kitmonsters](#)

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[Red Bull](#)

[Region Västerbotten](#)

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[Sliperiet Umeå Universitet](#)

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[Soundation](#)

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[Spendrups](#)

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[Swedbank](#)

[Teenage Engineering](#)

[Tiljan](#)

[Toontrack](#)

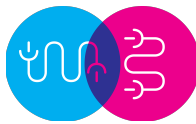
[Topi](#)

[U&Me](#)

[Umeå University](#)

[Umeå kommun](#)

[Ume.net](#)



[Uminova Innovation](#)

[Uminova Expression](#)

[Visit Umeå](#)

[Volvo](#)

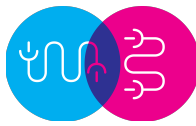
[Warner Music](#)

[YNK Produktion](#)



2.1.2.About Music Tech Fest Scandinavia - #MTFScandi

To organise #MTFScandi, employees of partner STRO worked solidly for many months to source and prepare the venue, facilitate technical and production set-ups, find and confirm presenters, performers and hack camp participants, bring on board sponsors and partners, put in place ticketing systems, organise travel and transportation logistics and promote the event to attract attendees.

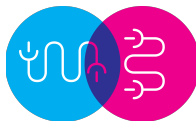


#MTFScandi took place from the 29th to the 31st of May 2015 at Sliperiet, the newly-opened interdisciplinary centre at Umeå University's Arts Campus, situated between the Architecture Faculty, the Umeå School of Design and Bildmuseet - Umeå's Museum of Modern Art. Because of an existing working relationship with the university and due to its renowned record of cultural excellence, a vibrant arts community and first class facilities, the organisation was selected as venue partner for #MTFScandi.

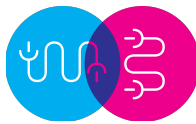
Under the guidance of their own technical director, partner STRO commissioned local companies to provide sound and lighting solutions as well as sourcing a team from Berlin for filming, live streaming and video production services. These teams and partner STRO's own production crew were aided on site by local volunteers from Umeå University and other organisations who offered vital assistance and in return gained valuable experience in their own personal and professional development.

Presenters for #MTFScandi were sourced by approaching known Scandinavian artists, creators and companies, asking local contacts for recommendations, scouring the internet for relevant options, inviting presenters from previous events and through website, newsletter and social media promotion. The festival incorporated 74 presentations, showcases and demonstrations of new musical inventions, interfaces, performances and projects across the weekend, including:

- 1) Alex Nowitz - performance
- 2) Reeps One - Cymatics Hacks performance
- 3) David Fernandez - Ecce Cello performance
- 4) Håkan Lidbo - project demos
- 5) Jon Jonsson - Teenage Engineering demos
- 6) Edwin Joassart - Herrmutt Lobby demos
- 7) Balandino Di Donato - Integra Labs presentation
- 8) Jonas Kjellberg - Gestrument demo
- 9) Patrick Bergel - Chirp demo
- 10) Miha Ciglar - Ultrasonic audio technologies demo
- 11) Jon Eades - Abbey Road Studio presentation
- 12) Kristina Bergenwall Sandberg - Laser Unicorns / Kung Fury presentation
- 13) Emmanuel Flety - IRCAM (MusicBricks R-IoT board) presentation
- 14) Frederic Bevilacqua - IRCAM (MusicBricks R-IoT board) presentation
- 15) Tracy Redhead - One Drop / Amorphous Track presentation
- 16) Andreas Sandström - LunaLEC demo
- 17) Matt Black - NinjaTune performance
- 18) Eden Grey (Chelsea Bruno) - The Art of the Modular Synth performance
- 19) Jan Bidner - Sounds that move you (gamification and motivation by using audio feedback)
- 20) Trond Lossius - BEk - Bergen Center for Electronic Arts / Ambisonic Toolkit (ATK) for Reaper
- 21) Run Dreamer (Rani Dar) performance



- 22) Morten Qvenild - Norwegian Academy Of Music / The HyPer(sonal) Piano Project
- 23) Dirk Stromberg - Strombophone performance
- 24) Tim O'Dwyer - Meta-Saxophone performance
- 25) Kenneth Alewine - Performing Melancholia demo
- 26) Alexander Schindler - TU-Wien / Video killed the Radio Star: Analyzing Music Videos for Music Recommendation
- 27) Katariina Nyberg - ExClaM! / Sibhack Rotterdam / You Are Here presentation
- 28) Terry Tyldesley - Kitmonsters / Playtime presentation
- 29) Dennis Braunsdorf - HKU / Prolody: Real Violin demo
- 30) Mark Towers - Isotonik / Arcade Series performance
- 31) Alex Morancy - Ironfist Music / #fistpics demo
- 32) Nick Zeigler (Ironfist) - Ironfist Music / #fistpics performance
- 33) Ben Dawson - Immersive Album LTD presentation
- 34) Johannes Taelman - Axoloti presentation
- 35) Willem Zwagers - Interactive Institute Swedish ICT / Audification of Absence presentation
- 36) Adam Scrimshire & Adam John Williams - Improvisation: Guitar and Tech performance
- 37) Michela Magas, Andrew Dubber, Cyril Laurier, Peter Lundgren - Tjay Launch demo
- 38) Anders Lind & 40 children - Umeå University / Composition for Animated Notation performance
- 39) Faraz Sayed & Stan Lewry - Opto Noise demo
- 40) Benjamin Mørk - MØRK performance
- 41) Jason Singh, Graham Massey (808 State), Scanner (Robin Rimbaud) performance
- 42) Hasse Hjörtek & Jan Ferm - Kulturverket presentation
- 43) Siobhan Ramsey & Tom Flynn - Sandbox Education / Volvo Kids Hack Camp demo
- 44) Bil Bryant - Soundation presentation
- 45) Matan Berkowitz - Shift / DisCoTech - Music Technology for Special Needs presentation
- 46) Vahakn Matossian - Human Instruments presentation
- 47) Nigel Papworth - Interactive Institute Swedish ICT / Voice Harvester presentation
- 48) Anne Dvinge - Low-Fi presentation
- 49) James Brewster - Electro-Acoustic Café presentation
- 50) Georgios Kaiafas - European Commission / EASME presentation
- 51) Paul Sonkamble - Deerlily presentation
- 52) Linda Iro - Random Bastards presentation



- 53) Filip Koludrovic & Piotr Paduch - Trackathon performance
- 54) Jordi Janer - Music Technology Group, Universitat Pompeu Fabra / #MusicBricks presentation
- 55) Alexandra Antonopoulou - Creative Ring Workshop presentation
- 56) Petter Ericson & Tomas Hårdin - Umeå Hackerspace presentation
- 57) Balandino di Donato - Cubindisphere Hack demo
- 58) Laura Kriefman & Phill Tew Hack demo
- 59) Rojan Gharipour - Dolphin Hack demo
- 60) Tobias Widlund - Pictunes Hack demo
- 61) Kim Wong - Pictunes Hack demo
- 62) Horácio Tomé Marques, Xico Teixeira & Fanni Fazakas - FindingSomethingBondingSound
- 63) CJ Carr - Trackathon Submission Bot Hack demo
- 64) Patrick Bergel - Chirp / Aether Drone demo
- 65) Oliver Pribyl - Glove FX demo
- 66) Gudmar Söderin - Another Brick On The Wall demo
- 67) Max Virus, Finn Juniper Denaro - Timtam Hack demo
- 68) Ginger Leigh (Synthestruct) - EEG Cymatics Hack demo
- 69) Petter Ericson Synthobone (One-Handed Instrument) demo
- 70) Linnea Dimitriou - Creative Director, Sliperiet presentation
- 71) Laura Kriefman & Phill Tew - Guerilla Dance Project performance
- 72) LJ Rich - Perfect Pitch Productions LTD / The Audience Experience as Co-Performance
- 73) LJ Rich & Emil Åreng - Synaesthetic Musical Cocktail performance
- 74) MTF Allstars - Jam Camp Live performance

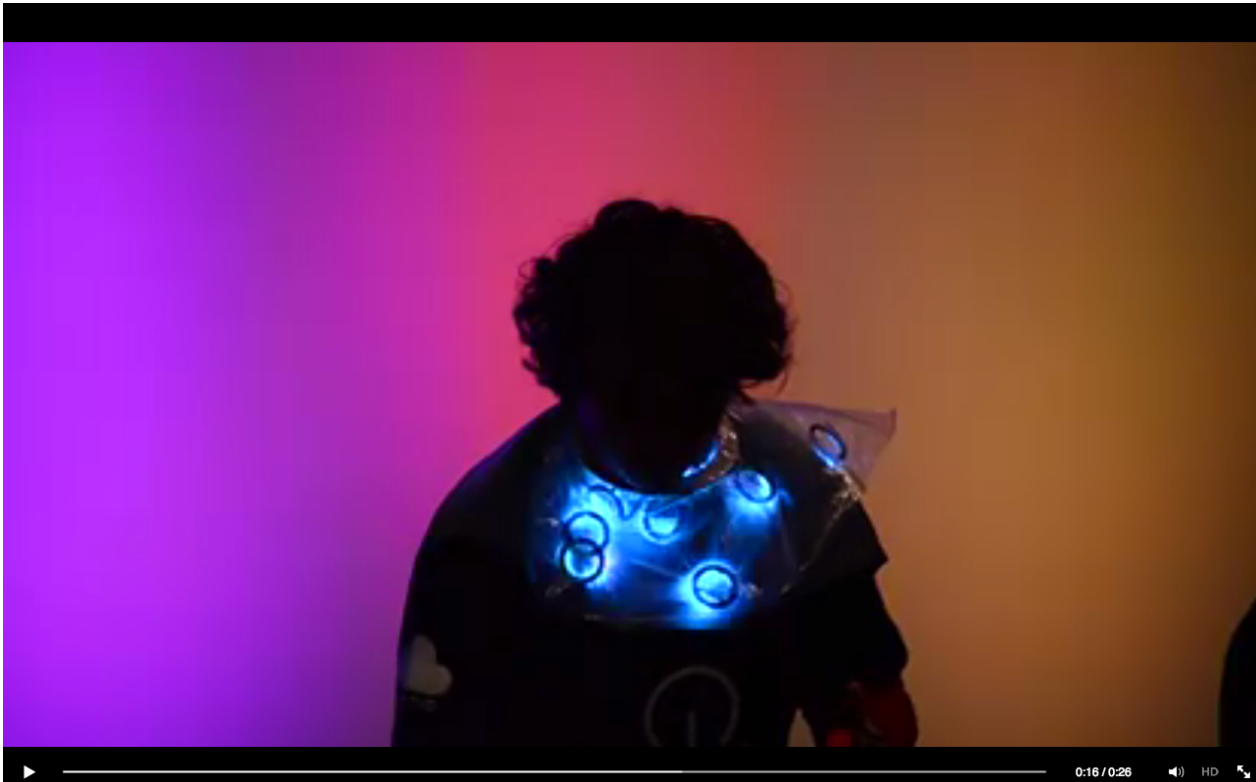
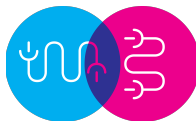
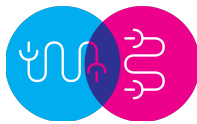


Fig 1: Hacker demo presentation on the main stage at #MTFScandi

In addition to the main festival stage, #MTFScandi also featured a sound recording studio filled with musical instruments and equipment, arranged as a 'jam camp' in which any festival attendee could pick up an instrument and join in. Sonic art installations were set up throughout the building - including a darkened room in which three 2m-tall colourful inflatable cubes comprised the world's largest MIDI controller; a forest environment and sound experience; a 'hackable music room' in which playing musical instruments controlled video projection displays; a bubble-making musical table; and a voice harvester machine, containing colourful powders and liquids that responded to the voices of festival visitors. Music producers gathered in the 'Trackathon' - a 24 hour challenge to create a new recorded work using a pre-selected library of sounds. Workshops included a Creative Ring workshop that explored ideas that would use the CreaCity platform for the city of Umeå, Sweden. CreaCity was released as part of the European SPECIFI project to develop tools for engagement with city culture and local businesses. The festival also featured a Kids Hack Camp. As an introduction to creative technologies, local children learned to work with physical computing and software to create musical inventions to showcase on the main stage at #MTFScandi. The festival also featured DJs, food, a beer tent, a film screening, a tour of the famous Guitar Museum in Umeå and a range of interactive experiences, product demonstrations and networking opportunities.



Fig 2: Hacker awards at #MTFScandi and Kids Hack workshop which ran in parallel to the adults Hack Camp



In amongst this environment, #MTFScandi also featured a 24-hour hack camp that provided the first Creative Testbed and seed ground of ideas for the #MusicBricks projects. 50 hackers from 14 countries gathered to respond to a series of technical and conceptual challenges, and the #MusicBricks tools and technologies were made available to the hackers for the first time. The #MusicBricks partners were on hand to both showcase the technologies' capability and coach the hackers in the use of the tools.

Because of the high calibre of the hackers selected and invited either personally or via an online application process to attend the event, four strong #MusicBricks ideas were selected by the judging panel to be supported to commercial prototype. Judges were impressed by the level of innovation and the commercial possibilities of the projects. The judging panel featured highly respected invited guests from music and technology fields including Josh Saunders, Matt Black, Jason Singh, Paul Sonkamble and LJ Rich, as well as the #MusicBricks partners.

Throughout all areas of #MTFScandi the event was supported by partners and sponsors who provided assistance such as financial support, prizes and equipment.

Music Tech Fest is always filmed and often live-streamed online, and each performance, presentation and individual hackathon demonstration - including the hacker awards - is made available globally via YouTube. The event is actively promoted through MTF social channels - including 3,578 Twitter followers, and a mailing list of 4,063 people. At #MTFScandi, a high proportion of the hacker projects used the #MusicBricks tools, and these were discussed in some depth across social media resulting in a social reach of over half a million people.

2.2.Sonar+D Music Hack Day, Barcelona

2.2.1.About the Music Hack Day

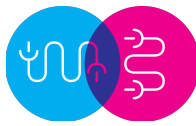
The first [Music Hack Day](#) was organised by Dave Haynes and James Darling and held at the London offices of [The Guardian](#) newspaper over the weekend 11/12 July 2009. Since then, this initiative has proved to be a great way to demonstrate the creativity around music that comes from the tech community, fostering cross-platform and cross-device innovation.

In the past six years, more than 50 Music Hack Day events have taken place around the world, with over 3500 participants who have built over 1300 innovative hacks with the support of about 250 music and technology companies. The events are attended by a diverse range of music and technology enthusiasts who are creating increasingly more interesting projects as each event goes by. Its mission is to fast prototype and create brand new music apps (web, mobile or physical) in just 24hrs, to bring together the music industry and the developer community to highlight and software and hardware tools of companies working in and around music tech, and to foster cross-platform and cross-device innovation.

2.2.2.Music Hack Day in Barcelona

The **MHD in Barcelona** was started in 2010 by the [Music Technology Group](#) of the [Universitat Pompeu Fabra](#) in Barcelona. This is one of the most popular Music Hack Days because it is organised as a satellite event of the [Sonar+D](#) – the space for creativity and technology within the pioneering electronic music festival Sonar in Barcelona.

Thanks to this collaboration, the companies participating in the Music Hack Day benefit from the vast exposure of the Sonar Festival (about 118.473 spectators coming from 104 countries, 200k visits streaming, 4.000 accredited professionals, 2.000 companies and almost 1.000 journalists accredited last year in 2015). Furthermore, all the hackers get to enjoy the wide range of Sonar concerts and activities exclusively included as a reward for their hard work during the hacking session.



2.2.3. About Sonar Festival

Sonar is an advanced music and new media art festival that has taken place in Barcelona for the last twenty years. A pioneer in its format and content, it combines entertainment with art, divulging the latest trends in advanced music and its interactions with other musical genres and artistic disciplines.

Sonar+D is the meeting point for professionals from the music and applied audiovisual and new media creation industries. It pledges commitment to the creative industries and connects local with the international initiatives. A new pro-active concept encourages interaction and the interrelation more than ever in the unique context of the festival, proposing debate, interchange of experiences, live experimentation, training, exhibitions and demonstrations.

2.2.4. Music Hack Day in Barcelona 2015

In 2015 the Barcelona MHD offered a new theme of wearable and multi-modal technology applied to music creation and performance. This special track brought together experts on bio and motion sensing, interaction design and wearable interface prototyping. Activities and resources relating to this included:

- A hands-on [workshop](#) sponsored by the [RAPiD-MIX](#) European project on *Designing expressive wearable technology for music performance*, where participants combine innovative multimodal sensing technology ([BITalino](#)), real-time machine learning interfaces ([Wekinator](#), [GVF](#)) and audio synthesis/processing libraries ([Maximilian](#), [JUCE](#)) for prototyping wearable, mobile music interfaces and instruments involving physiological computing and motion sensing.
- A second practical workshop specialising in music processing tools sponsored by #MusicBricks. Further details about this workshop are available in **Section 3.2.1**.
- A [talk](#) on [Yuya Kikukawa's](#) journey in wearable interface design, from winning the Sonar+D challenge at last year's Barcelona MHD with the first prototype of his smart-shoes system [Orphe](#), to developing it as a product through a successful crowdfunding campaign earlier this year.
- A [talk](#) by [Alex Murray-Leslie](#) and [Sam Ferguson](#), about their fascinating work on *Computer enhanced footwear for live art*, including a live demonstration of their prototype system.
- A [performance](#) curated by [Di Mainstone](#) and [Becky Stewart](#), based on the latest iteration of their instrument/installation [The Human Harp](#).
- A [performance](#) by [Atau Tanaka](#), one of the pioneers in music performance with biosignal interfaces, performing his piece *Myogram*, an 8 channel sonification of muscular corporeal states.
- An innovative **set of technologies** (both software and hardware) that helped participants to conceptualise, build and demonstrate their wearable interfaces. The list of technologies available included 3d printers, knitting machines, toolkits for rapid prototyping using body signals, hackable shoes, Nao robots, Brain Computer Interfaces, conductive ink, etc (see the event's [Tools](#) page for more details).
- 100 hackers selected from 200 applicants based on their skills, previous portfolio of projects and plans for hacking.

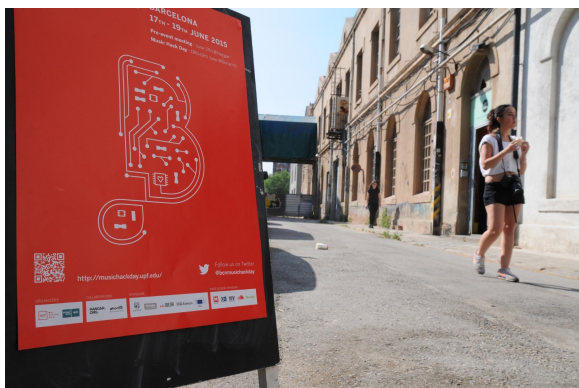
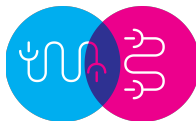


Fig 3: Successful #MusicBricks workshop at Sonar+D on the day before the Music Hack Day (bottom right)



2.3.#MTFCentral, Ljubljana, Slovenia

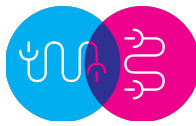
2.3.1.About Music Tech Fest Slovenia - #MTFCentral

As with #MTFScandi, the organisation of #MTFCentral was begun many months in advance by partner STRO. The festival took place from the 18th to the 20th of September 2015 at Cankarjev Dom in Ljubljana, Slovenia, a venue that was selected and secured through a partnership with the Earzoom festival, an organisation who already had a solid working relationship with the venue. As Slovenia's premier concert and exhibition venue, and with its location in the capital of Slovenia right in the heart of Europe, Cankarjev Dom provided an ideal setting for #MTFCentral.

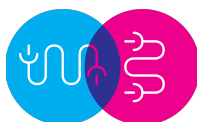
Similarly to #MTFScandi, partner STRO commissioned local companies to provide sound and lighting solutions whilst this time bringing along its own team for filming and video production. On top of this the venue provided an excellent team of managers and technicians who were a great asset towards delivering a highly professional event. These teams and partner STRO's own production crew were aided on site by volunteers from the local SAE school as well as members of the Music Tech Fest community.

As before, presenters for #MTFCentral were sourced by approaching known Central European artists, creators and companies, asking local contacts for recommendations, scouring the internet for relevant options, inviting presenters from previous events and through website, newsletter and social media promotion. The festival incorporated 70+ presentations, showcases and demonstrations of new musical inventions, interfaces, performances and projects across the weekend, including:

- 1) Ableton (Antonio Križnič)
- 2) Adam John Williams
- 3) Airstument (Ariel Angel, Rani Dar)
- 4) Alba B. Rosado
- 5) Alexander Grigoryev
- 6) Aleš Hieng Zergon & Robertina Šebjanič
- 7) Andrea Santini
- 8) Ann Rosén & Sten-Olof Hellström
- 9) Brane Zorman
- 10) Chris Reilly
- 11) Cirkulacija 2 (Borut Savski, Stefan Doepner and Boštjan Leskovšek)
- 12) Claire-Gillian Watt
- 13) Daniel Žuvela
- 14) Dolphin (Rojan Gharibpour)
- 15) Dušan Zidar
- 16) Eear (Cárthach Ó Nuanáin, Ángel Faraldo, Martin Hermant, Daniel Gómez)
- 17) Eden Grey
- 18) Elio Icaza Milson
- 19) Enboard (Juan Felipe, Gómez Steven Bolaños)



- 20) Erzetich Audio (Blaž Erzetč)
- 21) FindingSomethingBondingSound (Francisco Teixeira, Horacio Tome-Marques, Fanni Fazakas)
- 22) Giorgio Klauer
- 23) Graham Massey
- 24) Håkan Lidbo
- 25) Harshside (Anej Kočever & Kaja Skrbinšek)
- 26) Hi Note (Vahakn Matossian, Pere Calopa Piedra)
- 27) Interactive Cube (Balandino di Donato, Per-Olov Jernberg)
- 28) Jamie Bullock
- 29) JMZM (Zoran Medved & Josip Maršić)
- 30) Johannes Lohbihler
- 31) Justin Paterson
- 32) Kenneth Alewine
- 33) Leonardo Gabrielli
- 34) Luka Prinčič
- 35) Luka Zakrajšek
- 36) Makelight United (Joanna Alpe, Luka Topolovec, Tine Postuvan)
- 37) Manca Žerovnik
- 38) Matej Rodela
- 39) Matevž Pesek
- 40) Matt Black
- 41) Miha Mohorčič and Karmen Gostiša
- 42) MMessy Oscillators (Deborah Hustič, Boris Vidošević, Barbara Munitić, Ana Horvat, Dina Jekanović, Igor Petrovič, Damir Prizmič, Igor Brkič)
- 43) Nina Farič
- 44) Nitin Sawhney
- 45) Phil Heeley
- 46) Philips Hue (Tom Reinhoudt)
- 47) Reeps one
- 48) Rob Canning
- 49) Rolf Gehlhaar
- 50) Run Dreamer (Rani Dar)



- 51) Sebastian Lexer
- 52) Simon Penšek
- 53) Slavko Glamočanin
- 54) sonda3
- 55) Sonible (Peter Sciri, Alexander Wankhammer)
- 56) Sound in Translation (Juan José, Bosch Vicente)
- 57) Soundtrap (Jonas Lundquist, Vanja Steinholtz, Linnéa Rodén)
- 58) Spencer Salazar
- 59) Stephen Hetherington
- 60) Synthomir (Damir Prizmić, Igor Brkić)
- 61) Tadej Droljc
- 62) Tamara Friebe
- 63) Thermidi Orchestra (Dušan Zidar, Tina Dolinšek, Robertina Šebjanič, Dare Pejič, Ida Hiršenfelter, Luka Frelih, Tilen Sepič, Simon Bergoč, Saša Spačal)
- 64) Tom Fox
- 65) Uzvocevalci (Zvonka T. Simčič, Bogdana Herman, Borut Savski, Franc Cegnar, Miha Tomšič)
- 66) Vahakn Matossian
- 67) Vincent Favrat - Musimap
- 68) Whitestone (Roey Tsemah)
- 69) Yoshihito Nakanishi

Presentations on the main stage were grouped into themed sessions representing the different approaches to musical and technological innovation on display, allowing audiences to choose particular topics that most interested them. The sessions were:

FRIDAY 18th: THE SCIENCE OF MUSIC, THE MUSIC OF SCIENCE:

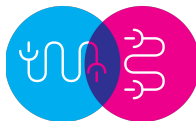
4pm: The Science of Music

Experimentation is at the heart of music's progress - not just in terms of what it can sound like, but also how it can be used. The scientists of music are producers, hackers, craftspeople, therapists, composers, teachers and industry innovators. From the hospital to the Internet, and from wearable musical instruments to the reinvention of classical music - this session investigates new ways of thinking, alternative uses and new experiments in the science of music.

FEATURING: Simon Penšek, Elio Icaza Milson, Blaž Erzetič, JMZM collective, Roey Tsemah (Whitestone), Vincent Favrat (Musimap) and Ann Rosén / Sten-Olof Hellström

6pm: The Music of Science

Data becomes art. Physical processes and reactions create sound. Equations create rhythms. The worlds of physics, chemistry, mathematics and biology combine in the mind of the computer to create sonic artwork and musical experiences unlike any we have known before.



FEATURING: Joanna Alpe / Luka Topolovec / Tine Postuvan (Makelight United), Andrea Santini, Robertina Šebjanič / Aleš Hieng Zergon, Matevž Pesek / Luka Zakrajšek / Manca Žerovnik, Adam John Williams, Peter Sciri / Alexander Wankhammer (Sonible) and Rolf Gehlhaar

8pm: Strange Dreams

Music's greatest power is on the subconscious mind. Through cinematic immersion, giant controllers and underground currents of molten rock, we explore the collapse of the imaginary barriers between artist and audience, performance and space, dream and reality.

FEATURING: Leonardo Gabrielli / Paolo Bragaglia, Luka Prinčič, Håkan Lidbo, Brane Zorman and Uzvočevalci

SATURDAY 19th: PERFORMANCE CYBORGS:

2pm: The Creator's Laboratory

A look into the experimental laboratory, where ingenious minds tinker in basements and breathe life into found objects and affordable electronics. Discover new uses for 8-bit lo-fi technologies and join the quest for pioneering noise machines fashioned from as much recycled material as possible.

FEATURING: Matej Rodela (Trobla), Damir Prizmić / Igor Brkić, Daniel Žuvela (Maltempo effects), Slavko Glamočanin (Naprave), Johannes Lohbihler (dadamachines), Sonda3, Tom Fox (Vulpestruments) and Matt Black (Ninja Tune)

4pm: Performance Cyborgs

The boundary between science fiction and social reality is an optical illusion. This session takes the intangible and ephemeral world of music and makes it physical: a tactile and gestural phenomenon. The body becomes the musical instrument and we manipulate sound in space like a malleable, three-dimensional object in the air.

FEATURING: Sebastian Lexer, Cirkulacija 2, Jamie Bullock (Integra Lab), Antonio Križnič (Ableton), Harshide, Giorgio Klauer and Rob Canning

6pm: Technology Mutants

We shape our tools, and they, in turn, shape us. We recycle machines and hybridise instruments, manipulate memory, interpret data and transform ourselves through musical expression. We are what we create.

FEATURING: Yoshihito Nakanishi, Tadej Droljc, Dušan Zidar, Alexander Grigoryev, Miha Mohorčič / Karmen Gostiša and Chris Reilly

8pm: GUNK: Geek Punk

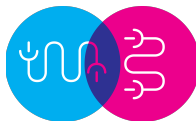
Technology is not sterile. It's messy, rough and ready. It's about immediacy of expression. Get your hands dirty, pull something apart, make new noises, form a band. Geek punks, electro legends and music hackers join forces to tear up the stage. No future? No - this IS the future.

FEATURING: Eden Grey, Theremidi Orchestra, Nina Farič, MMessy Oscillators (Deborah Hustić, Ana Horvat, Boris Vidošević, Layla Munitić, Igor Petrović), Matt Black (Ninja Tune) and Graham Massey (808 State)

SUNDAY 20th: #MTFLaunchpad:

2pm: #MTFLaunchpad

Introducing the inventors of the future: children enter the world of music technology through coding and making; barriers to participation in music are removed with instruments accessible to people with disabilities; intuition is enhanced through collaboration and new musical possibilities.



FEATURING: Tamara Friebe (The Collaborative Mind), Claire-Gillian Watt, Vahakn Matossian (Human Instruments), Stephen Hetherington (OHMI Trust), Phil Heeley (Inclusive Music), Jonas Lundquist / Vanja Steinholtz / Linnéa Rodén (Soundtrap), Justin Paterson and Kenneth Alewine

4pm: #MusicBricks

8 new startups and over half a million on social reach after just 6 months: #MusicBricks is a toolkit of some of the best music technologies coming out of EU research centres that allow creators, developers and digital content makers easy access to core building blocks of music. At #MTFCentral we exclusively reveal the innovative prototypes from the first round of #MusicBricks incubation.

FEATURING: #FindingSomethingBondingSound, Hi Note, Sound in Translation, Aistrument, Enboard, Ear, Dolphin, Interactive Cube, Alba B. Rosado and Tom Reinhoudt

6pm: #MTFHacks

Your first chance to see the inventions and designs by creative developers using some great new technologies including #MusicBricks, a compendium of both physical and virtual interfaces and APIs, exclusively available at #MTFCentral. From new types of physical interfaces and performances to software projects and startups. Every completed hack will be demonstrated and the winners will be announced on stage.

8pm: #MTFSessions

World famous artists perform with emerging local artists, using new musical instruments and in entirely new collaborative contexts. It's not just an experimental, improvisational session featuring some of the finest artists in the world of music technology - it's also a jam session and a party.

FEATURING: Phil Heeley (Inclusive Music), Run Dreamer, Matt Black (Coldcut), Reeps One, and many more.

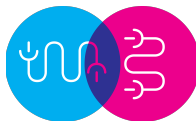
In addition to the main festival stage, #MTFCentral also featured a sound recording studio filled with musical instruments and equipment arranged as a 'jam camp' in which any festival attendee could pick up an instrument and join in. Workshops included a chance to build a 'Linguaphone of Tremulous Communion', a musical instrument that can only be heard by the two people who are playing it, and an 'Inclusive Music' workshop allowing everyone and anyone a chance to get creative. The festival also featured a range of interactive experiences including sound installations by Håkan Lidbo as well as product demonstrations and networking opportunities.

As with #MTFScandi, #MTFCentral also featured a 24-hour hack camp, providing the third Creative Testbed and seed ground for the #MusicBricks projects. 50 hackers from as far afield as Sweden, the United States, Israel and of course central Europe, gathered to respond to a series of technical and conceptual challenges, and the #MusicBricks tools and technologies were made available to the hackers once again. As with the previous events the #MusicBricks partners were on hand to both showcase the technologies' capability and coach the hackers in the use of those tools. Workshops were given on the Friday evening to guide the hackers through the #MusicBricks tools, their set-up and potential implementations.

Two more #MusicBricks were added to the available toolset by the industry partners at #MTFCentral in addition to the eight previous bricks. Furthermore, event partner and sponsor Philips brought their own HUE lighting solutions toolkit for the first transversal experiment joining #MusicBricks with sound and light for therapy, communication and performance.



Fig 4: Creative test bed seeding ideas and prototype demonstrations at #MTFCentral



At #MTFCentral the Hack Camp awards were judged by some eminent and highly respected music minds, including Graham Massey, Rolf Gehlhaar, Matt Black, and Nitin Sawhney, as well as by the #MusicBricks partners. Because of the high calibre of the hackers selected and invited either personally or via an online application process to attend the event, three more #MusicBricks ideas were selected by the judging panel to be supported to commercial prototype. Once again the judges were highly impressed by the level of innovation and the commercial possibilities demonstrated.

As a key milestone in the #MusicBricks project and as a fundamental and highly anticipated part of the festival, #MTFCentral also saw the onstage presentation of the results of the eight initial #MusicBricks incubated projects that emerged from the #MTFScandi and the Sonar+D Music Hack Day. All eight teams incubated at the time of the festival were represented:

- 1) Aistrument (Ariel Angel, Rani Dar)
- 2) Dolphin (Rojan Gharibpour)
- 3) Enboard (Juan Felipe, Gómez Steven Bolaños)
- 4) FindingSomethingBondingSound (Francisco Teixeira, Horacio Tome-Marques, Fanni Fazakas)
- 5) Hi Note (Vahakn Matossian, Pere Calopa Piedra)
- 6) Interactive Cube (Balandino di Donato, Per-Olov Jernberg)
- 7) Sound in Translation (Juan José, Bosch Vicente)

2.4.Waves Vienna Music Hack Day: Additional #MusicBricks Creative Testbed

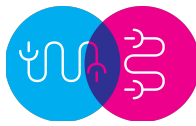
The Waves Vienna Music Hack Day was added to the DoW as an additional #MusicBricks Creative Testbed. The event was organised by the partner TU Wien IFS + HCI departments, Austrian Computer Society (OCG), Waves Festival and supported by MusicBricks through personnel at TU Wien IFS, as part of the 5-day Waves Central Europe Festival (Vienna + Bratislava). The event was run on a minimal budget and therefore did not have the capabilities to conduct thorough interviews and analysis, or to record and collect the levels of feedback, associated with the three previous Creative Testbed events. Only partner TU Wien was available at the event to interact with creative stakeholders. However the event consolidated relationships with industry partners, disseminated the #MusicBricks toolkit to new creative developers, and yielded an additional project for incubation.

2.4.1.About the Waves festival

In 2015 the Waves Festival was already in its 5th year. Since its inception, the festival has been organised as a Central European dual city event in Vienna and Bratislava, hosting a large number of venues spread across these two cities: 16 venues in the inner city of Vienna and 10 venues around the city centre of Bratislava. In 2014, it had about 14,000 visitors in Vienna alone (+ about 5000 in Bratislava), and 923 delegates from music industry (from 39 different countries).

In each year, one or more guest countries are invited to present showcase acts from their region. In 2015, the festival's theme was "East meets West" and the guest countries were Estonia, Latvia and Lithuania.

In 2015 a re-branding to "Waves Central Europe" took place, together with a completely new visual design. At the same time, the festival broadened up: A collaboration with the "Music Industry Business Days" extended largely the "Waves Conference" at the University of Music and Performing Arts of Vienna. A Video Stage was incorporated together with a new sponsor. Lectures, workshops and panels were aimed at help-



ing emerging artists and musicians. And a new collaboration with TU Wien and OCG was established by April 2015 to prepare the first edition of the Waves Vienna Music Hackday.

2.4.2. About the Waves Vienna Music Hack Day

The Waves festival kindly offered the Music Hackday three rooms at the main venue, the “Alte Post” in the heart of Vienna’s City Center. Given the little time (and small budget) for organising the event, the outcome and feedback was tremendous. A small team of three from TU Wien and one from OCG (Austrian Computer Society) prepared the event, in coordination with the Waves Festival organiser, Thomas Heher, who provided the hackday with rooms, drinks and the promotion around the festival. Two rooms were procured for the main hackathon and an additional one for a “Kids Hack”.

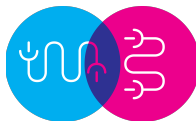
Partner OCG has extensive experience in hosting workshop for children of various ages and for the Waves Vienna Music Hack Day they set-up and supported five themed stations for children to playfully discover the world of music & technology:

- Blocks that swing: composing music in Minecraft
- Build a Theremin (an instrument that’s played in the air) and program it with Scratch
- A Dash Robot with a Xylophone going on a journey
- Numbers making music: create music with Excel
- Fruits making sounds: with MakeyMakey and Scratch

The hackday was designed as an single day (10 hour) event, due to being the first time it was presented at this festival and also for space and scheduling reasons. Nevertheless, it turned out that even with a 10 hour hackathon great results can be achieved, aided by encouragement towards the event principles “doing & making” and “collaboration”. There were no specific prizes announced or given for this hackday, so all the attendees registered purely for the fun of hacking, collaboration and creativity.

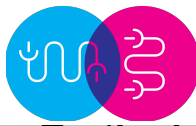
Inspired from previous international editions of Music Tech Fest and Music Hack Day, a large set of toolkits were provided, both in hardware and in software, with MusicBricks being prominently presented by the TU Wien team. The tools available to hackers included:

- #MusicBricks toolkit (one additional #MusicBrick was added to the toolkit by the Wave Vienna Music Hackday bringing the total available to 11)
- Arduinos
- Raspberry Pi’s
- Makey Makey’s
- Pico boards
- GroovePi
- Bare Conductive Paint
- LilyPad wearable sewing set (with sensors, lights, buttons), conductive/luminous textile fabrics
- Neurosky Mindwave mobile headset (for brainwave measurement)
- Bitalino body signal board (measuring light, EEG, skin conductivity and muscle contraction)
- MIDI keyboards
- Korg KaossPad 3



- 3D printer
- Philips Hue: a colorful light system programmable via Apps and APIs
- Sonarflow: visual music discovery app for iOS and Android (open source on github)
- Search by Sound: audio-based music analysis engine and Web Music Similarity API (now open source on github)
- play.fm API: to get DJ set recordings, playlists, tracklists, comments, tags and more from play.fm
- And for the Kids Hack:
- Lego Mindstorms, Makey Makey's, Scratch, Picoboard, Minecraft, Blockly and more ...

A total of 70 people registered for the Waves Vienna Music Hackday and a final 50 attendees, including 15 children, participated in the event. The event went extremely smoothly and the organisers TU Wien were overwhelmed by the positive reaction and enthusiasm of the participants finding it particularly satisfying to see how the attendees mixed, teamed up and had great fun in experimenting with music technologies and working on exciting new ideas.



3. #MusicBricks at the Creative Testbeds

3.1.#MusicBricks at #MTFScandi

The Hack Camp at #MTFScandi brought together 50 hackers, artists & musicians from 14 different countries and gave them exclusive access to tools from #MusicBricks research partners. The most talented creative developers were headhunted and recruited from a week-long hacker gathering at Transmediale in Berlin, from the London Music Hackspace, from the Music Tech Fest global hacker community, and through a specially organised competition based on ideas of Cymatics. Winners of the Cymatics challenge came from Orlando and Boston in the US and from Budapest in Hungary.

Participants were challenged to devise and create a project within 24 hours, culminating with the presentation of that project on the main Music Tech Fest stage. With the focus on physical applications for music interaction and performance, creative developers were particularly incentivised to use the newly available #MusicBricks R-IoT microboard for motion sensing and motion analysis. Prizes and the possibility of sponsorship/incubation were available for participants who created projects to fit within one of the four challenge categories, written especially to fit the open methodology of a Music Tech Fest Creative Testbed. In the run-up to the festival each challenge category was created in such a way that participants would be inspired to create innovative projects, whilst not being prescriptive or directly describing exactly what sort of projects people were expected to create. The challenge categories and descriptions were as follows:

■ Music Things for Music Ecosystems

Devices and things used to stay separate unless physically connected. The Internet Of Things enables everyday objects to connect wirelessly and communicate through the cloud, but what are the implications of this for musical composition & performance? Invent a 'music thing' that can connect with other devices either locally or remotely, and form part of a musical ecosystem, a cloud orchestra of compatible devices for collaborative musical expression.

■ Sound Objects in Smart Homes

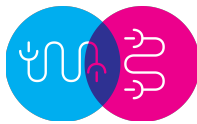
High quality music playback in the home was once reserved for nerds and audiophiles only, but thanks to advances in technology and acoustic research, high quality music playback is accessible to everyone. The new challenge this creates for designers & developers is that we now want these objects to fit in with our lives, in terms of their form, aesthetically & ergonomically, as well as with the way we now live our lives, how we use our devices, and how we connect with other people, discover new music and share the music we love with others. Invent a sound object for the smart home.

■ Cymatics

Cymatics is the creation of visual patterns in physical matter through sonic vibration. Continents have been shaped through vibrations. From the microscopically small to the cosmic scale, Cymatics is integral to nature. Cymatics comes together with brainwave entrainment through binaural beats. Create a performance, installation or system that demonstrates the power of Cymatics.

■ Music as Communication

Music has always been used as a form of communication & expression which transcends language, enabling exchange of information between people who speak different languages to one another or even people who cannot speak at all. This communication process goes more than just two ways, from one party to another, but also devices can communicate to their users the ways in which they can be used. Invent a device or system which enables musical communication and expression which requires no instructions.



3.2. #MusicBricks at Sonar+D Music Hack Day, Barcelona

#MusicBricks involvement with the Sonar +D Music Hack Day took place over three consecutive days; an initial workshop and introduction to the #MusicBricks tools and team on day one, followed by the 24 hour hackathon event itself. Participants signed-up for both of these events online where they also found background information about the #MusicBricks project. It was not compulsory to attend the workshop session in order to use the #MusicBricks technologies during the Hack Day event.

During the workshop session, which took place between the hours of 10:00 - 19.30 and included meals for participants, the #MusicBricks technologies available for the Sonar+D Music Hack Day were explained in depth by the #MusicBricks project partners responsible for the development of each tool and participants were guided through any necessary download and set-up protocols to get them up and running. This session allowed interested hackers the chance to find out in much more detail the scope and potential of each tool as well as a first opportunity to get hands on experience of using them in advance of the Sonar +D Music Hack Day competition itself. Furthermore, it allowed #MusicBricks team to get to know the hackers, to answers queries about the tools, the project and the incubation process and to spot how project ideas and hack teams began form.

The project team also reiterated that the project incubation programme offered hackathon projects that made use of the #MusicBricks tools the possibility to develop their initial hack further towards a more stable and sustainable prototype, by providing support for a several month long incubation phase. Videos of the winning #MusicBricks projects from the previous #MTFScandi event were shown to illustrate the standard of winning hacks, show the potential of the tools and to help teams come up with original concepts.

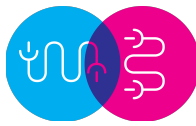
22 participants took part in the workshop and were introduced to the #MusicBricks dealing with Melody & Bass Transcription, Beat & Key & Tempo Detection, Real-time Monophonic and Polyphonic Pitch Detection, Rhythm and Timbre Analysis & Extraction, "Search by Sound" Music Similarity Retrieval and Gesture Sensors for Music Performance (R-IoT board).

During the session, outside of technological and implementation queries for the #MusicBricks technologies, the most common questions surrounded the competition prize and how the incubation process worked. What were the judges looking for? To what stage where projects expected to be developed within 24 hours? What exactly were incubations? Were they residencies in one particular location with a #MusicBricks partner? How much financial support would be given?

These questions were not unexpected. This was not due to any unintended lack of clarity in the prize description, rather it was a consortium decision to keep such parameters open. During previous EU FP7 project ICT&ART Connect, in which #MusicBricks partners Sigma Orionis and Stromatolite both formed part of the consortium, it was found that awarding equal allocations of incubation support, both financially and in terms of partner time, did not reflect the actual needs of projects. Factors such as the number of team members, where they each lived, how they best worked and what specific type of help was needed were much more significant to the success of all projects rather than equal apportioning of available support. Furthermore, not concentrating on specific tangible prizes allows those that are more interested in their own ideas and project goals, rather than winning prizes, to come to the fore.

After the workshop, the attendees enjoyed talks and performances related with the topic of this year's MHD: "Wearables and music performance".

The Music Hack Day itself served as a Creative Testbed for the #MusicBricks interfaces and tools, involving the 100 hackers in the process of applying creative seed ideas to the use of the #MusicBricks data and assets to discover new use cases and applications.



The #MusicBricks consortium set a challenge for the hackers in order to establish a minimum criteria for the selection of the winning hacks but at the same time trying not to add constraints to the creativity of hackers. The challenge was phrased as follows:

“Many great accomplishments come from the play between order and chaos.

In September 1928 a series of chance incidents within the highly controlled conditions of a hospital laboratory led to the discovery of penicillin by Alexander Fleming and the saving of an estimated 100 million lives.

Within the field of the arts, in the 1950s and 60s composers such as John Cage and Terry Riley changed the rules of conventional music composition and performance by combining precise and specific scores with elements of indeterminacy and randomness.

Music is essentially about both rules (pitch, timbre, tempo, genre) and freedom (creativity, uncertainty, chance, the unexpected).

Make something that addresses this paradox. Your creation should use one or more #MusicBricks, or have the potential itself to become a #MusicBricks in the future.”

3.3.#MusicBricks at #MTFCentral

The Creative Testbed at #MTFCentral brought together 50 hackers, artists & musicians and gave them exclusive access to tools from #MusicBricks research partners. The most talented creative developers were headhunted and recruited from hacker site <http://hackerspaces.org/> in order to find local hackerspaces and groups, from the London Music Hackspace and from the Music Tech Fest global hacker community. Participants were challenged to devise & create a project within 24 hours, culminating with the presentation of that project on the main Music Tech Fest stage.

A particular success of the Third Creative Testbed was the first transversal experiment conducted thanks to the partnership between the Music Tech Fest and Philips. For the first time creative developers were able to use the #MusicBricks toolkit in combination with the Philips Hue lighting API, thus conducting experiments with sound and light. Three transversal challenges were set, covering sound and light for therapy, communication and generative performance.

Industry presence was a feature of the event with industry stakeholders requesting to add their own IP for inclusion in the #MusicBricks toolkit, thus increasing the toolkit to 11, unplanned by the DoW. Hence, printed guidelines and stickers were updated with the 11 #MusicBricks now available for the testbed.

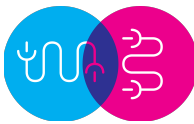
With the focus again on physical applications for music interaction and performance, creative developers were particularly incentivised to use the #MusicBricks R-IoT microboard for motion sensing and motion analysis. Prizes & the possibility of sponsorship/incubation were available for participants who created projects to fit within one of the four challenge categories, written especially to fit the open methodology of a Music Tech Fest Creative Testbed. In the run-up to the festival each challenge category was created in such a way that participants would be inspired to create innovative projects, whilst not being prescriptive or directly describing exactly what sort of projects people were expected to create. The challenge categories were as follows:

■ **Philips 1: Interactive sound and light therapy**

Light and colour can be powerful tools when creating a personalised environment. Calming light can make a huge difference for those with mental disabilities, for example in a sensory room where the participants can observe the lights and listen to the music, but they can also interact with them as well if they wish. Design a system that creates a tailored, interactive environment.

■ **Philips 2: Translate music into light, translate light into music**

Light and music mapping/language: how can we assign light to music and vice versa? What makes sense to link? Staccato with brightness or tempo with saturation...?



■ **Philips 3: Generate with music and light**

Gestures and sounds can also trigger changes in light and colour. A system can be created that allows the performer to trigger the entire stage environment. Using Hue alongside musical instruments, create sound and light scenes that can be saved and recalled.

■ **Musimap: Navigate emotion in space**

Music can be defined as the careful arrangement of sound and silence to convey a story, idea or emotion, or simply to create something aesthetically pleasing. Music's powerful ability to make us feel and recall emotions in a predictable and repeatable way separates it from other art forms.

By exploring music in new and different ways, and grouping your library by emotion or other factors, would your consumption of music change?

How can you navigate the emotions of music in a way that is tangible and intuitive?

By changing your relationship with music as a consumer or creator, what impact could that have on your life and the lives of others?

■ **B3 Media: Hack The Artist**

B3 Media's #HacktheArtist challenge will take the artists and their projects to the 24- hour hack camp at #MTFCentral in Ljubljana for the opportunity to team up with creative technologists, work with new media tech and translate their creative ideas into fresh forms that will lead the way in future storytelling platforms.

■ **barryslounge: Hack The DJ**

Music Tech Fest's resident DJ (and accountant) Sydney a.k.a. Barry's Lounge will be spinning tunes for us from his amazing selection of rare 7" vinyls. It's time for his immersion in the world of MTF to reach the next level. Let's Hack Barry's Lounge.

3.4.#MusicBricks at Waves Vienna Music Hack Day

As #MusicBricks was considered a partner at the festival (represented by TU Wien), the #MusicBricks logo appeared on the event website and flyer and #MusicBricks was listed as an official partner of the festival:

<http://www.wavescentraleurope.com/partners-vie/>



Fig 5: Waves Vienna Music Hackday flyer

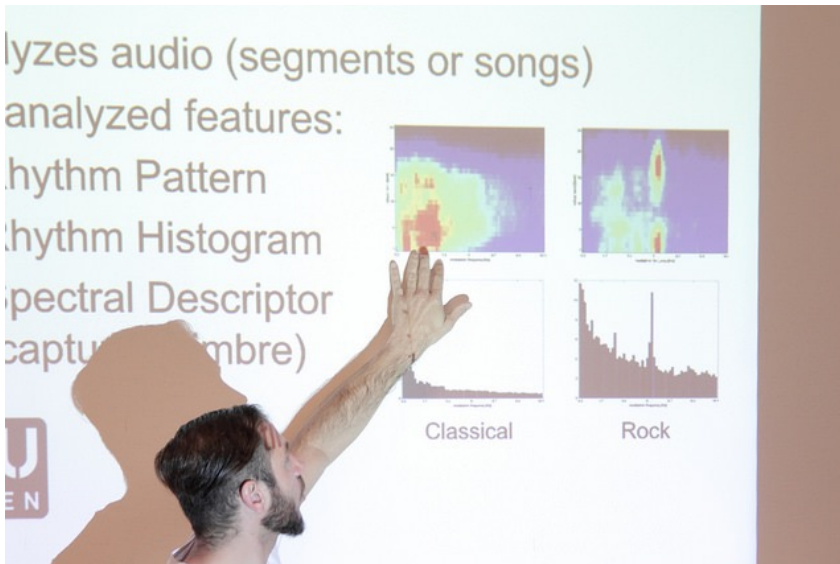
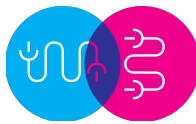


Fig 6: #MusicBricks presentation at Waves Vienna Music Hackday

As with the previous Creative Testbeds the #MusicBricks toolkit was presented to participants at the event for their application during the Hackathon Challenges. On top of the 10 tools already available, a further industry-created tool was added at the end of September, meaning by the time of the Music Hack Day at the Waves Festival in Vienna there were a total of **11** #MusicBricks in the toolkit. Furthermore, due to Music Tech Fest's partnership with Philips, participants at the Waves Vienna MHD were also able to make use of the Hue Light developer kits and take part in the transversal experiment of developing new experiments combining audio and visual technologies for therapy, communications and performance.

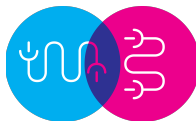
No challenges or prizes were offered for participants, rather the teams took part for the joy of free creativity and collaboration.

Final Video Summary about the event: <https://www.youtube.com/watch?v=Vz5rLHo6vII>

3.5.Results from #MTFScandi

There were 50 places in the [24-hour hack camp](#) at #MTFScandi for the most talented creative developers who had, for the very first time, access to exclusive new #MusicBricks technology and to microfinance for the best projects to incubate and further develop to commercial prototype. In order to ensure that ideas that start at Music Tech Fest go on to have a sustainable life outside of the festival, some great music tech minds joined to help choose those projects:

- [Matt Black](#) is one half of the legendary electronic music duo Coldcut, and co-founder of the Ninja Tune label which has brought us the amazing talent of the Cinematic Orchestra, Bonobo and Amon Tobin. At Music Tech Fest we think of Matt as the "godfather of our festival" - he has been with us right from the start, premiered Ninja Jamm at the first fest, engaged some of our community in building the app, and has been demoing new ideas at every fest since.
- [Joshua Saunders](#) is Head of Technical and Creative (UK Digital) at the Warner Music Group. Josh has worked on award winning web and mobile and social projects for artists such as Gorillaz, Coldplay, David Guetta, Lily Allen, Swedish House Mafia, Damon Albarn and Blur, Emeli Sande, Deadmau5, Tinie Tempah, and also directly with partners at Apple, Google, Spotify, Facebook, Twitter and Soundcloud.
- [LJ Rich](#) is a presenter for BBC Click, specialising in music, tech, sci-fi and social, as well as a composer and pianist. At Music Tech Fest Boston LJ joined as a first time hacker and hasn't looked back



since - she teamed up with fellow #MTFHacks winners and has continued to develop a series of music therapy apps as well as report on hacking. She spoke about her conversion to a hacker at TEDx Tokyo.

- [Paul Sonkamble](#) has worked on the creative side of business development as Senior Director, Creative Business Development & Innovation, EMEA at Warner Music Group, and previously Head of Innovation and Insight at EMI Music Nordic. Paul is currently involved in a number of innovative ventures for the music industry.
- [Jason Singh](#) is a versatile vocal sculptor and beatboxer, who has worked with the likes of Nitin Sawhney, Rokia Traore, and Sebastian Rochford and has been resident sound artist at the V&A in London. Jason has been central to every one of our London fests, and has collaborated with a wide variety of hackers and artists, often in amazing impromptu performances, which have included a world first with Leafcutter John, Tim Exile and Yazz Ahmed at the Barbican LSO St Lukes.

These invited judges were joined by representatives of the #MusicBricks partners:

- TU Wien: Thomas Lidy, Alexander Schindler, Andreas Rauber
- Sigma: Marta Arniani
- Stromatolite: Michela Magas, Adam John Williams, Cyril Laurier
- Fraunhofer: Steffen Holly
- IRCAM: Frederic Bevilacqua, Emmanuel Flety, Gael Dubus
- UPF: Alba Rosado, Jordi Janer

#MusicBricks Winning Hacks:

- **Dolphin** – by Rojan Gharipour (**Product Platform** using the Ircam R-IoT sensor)

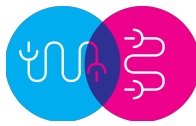
Using the #MusicBricks R-IoT board, Dolphin is an accessible gestural interface for controlling music selection & playback using head movements and head gestures. As a platform for interaction, the motion sensitive headphones can be used to track movement in space with respect to the audio played, as well as control that audio. [Watch the video here](#). Judges felt that the use of headphones as a platform for developing a range of head-motion applications using the R-IoT microboard had very good commercial potential. They were very impressed by the talent of the developer who had, for the very first time, been working with sound and with music-related programming packages.

- **Airstrument** – by Matan Berkowitz, Ariel Angel and Rani Dar (**Musical Instrument** using detection APIs and the Ircam R-IoT sensor)

Airstrument uses #MusicBricks technology to analyse an existing song, then allows the user to use hand gestures in order to play a melody within the scale and musical context. The aim is to create an intuitive instrument that will make music more accessible in new and exciting ways. [Watch the video here](#). Judges were impressed by the range of #MusicBricks used for this prototype, as well as the originality of their application.

- **FindingSomething BondingSounding** – by Francisco Marques-Teixeir, Horacio Tome-Marques and Fanni Fazakas (**Performance Interaction** using the Ircam R-IoT sensor)

This project is a response to the challenge of music as communication. It represents a duality between the mind and the body in a combination of performance and EEG brainscan data. The mind controls audio and video samples organized according to activation or relaxation; the body controls the effects according to position, acceleration and angle. [Watch the video here](#). Judges felt that this use of the R-IoT board creates an engaging performance which operates at the junction of science and art. The combination of EEG and motion sensing to drive this performance was highly original and had potential to be developed further.



- **Interactive Cube** - by Per-Olav Jernberg and Balandino Di Donato (**Smart Home Music Product** using the Ircam R-IoT sensor)

The Interactive Cube is a physical interface for manipulating audio. The cube is composed by 5 led displays which show the projection of a sphere on each side of the cube. The position of the sphere within the cube is determined by the orientation of the cube, which is tracked using the R-IoT device, and this defines the balance mix of 5 audio loops, while the movement of the cube drives a stereo panning effect. The colour and size of the sphere, as well as the VU audio meters, are regulated by the audio signal elaboration outcome. [Watch the video here](#). Judges felt that this prototype had immediate potential to be developed into a lifestyle product.

3.6.Results from the Sonar+D Music Hack Day

12 hacks in total used one or several of the #MusicBricks available. The details of the #MusicBricks powered hacks are as follows:

- **Roli Stoned** - by Harris Christopoulos and Stylianos Ioannis Mimilakis

"Expressive surfaces in digital audio synthesis and music production have been practically proved to be a good choice for extending the capabilities of the users/players. Nevertheless, manipulation of audio samples can be further extended, in terms of spectral modifications, in order to overwhelm current expression capabilities. In this project, we present an audio analysis and synthesis engine, that allows cross synthesis and morphing, based on spectral templates. Thus, the user cannot only manipulate, but also generate new sounds under restrictive, in number, databases(audio banks) with just using his/her fingertips". The video recording of the hack presentation is [here](#).

- **JucyPaintAlinoBrick** - by Richard Vogl and Peter Knees

"A (wireless) tangible Synthesizer based on Jucy using ElectricPaint and Touchboard as input, #MusicBricks GestureSensor and Bitalino Data for Modulation". The video recording of the hack presentation is [here](#).

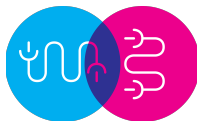
- **La Neurona Tropical** - by Andres Perez, Carles Julià, Carles Tardio and Martí Umbert

"How can the [one-man band](#)" concept can be extended? In this project we plan to do a performance with two musicians. The setup and technologies used by each musician is explained as follows. There are two modes/songs of the performance (controlled with PD): 1. "Harder better faster stronger" by Daft Punk: from which lyrics and onsets are analyzed and visually shown with the wearables (glasses, shoes) and 2. "Paella" song by La Neurona Tropical: This is loaded in 8 tracks, each one is controlled/triggered with the wearables. Musician 1: (i) Myo (arm): Is used to control Ardour sound effects; (ii) Bare (body): The electrically conductive paint is used to activate/deactivate tracks and effects; (iii) LED Glasses (1/3): light flashes are synched with tempo (used for any song); (iv) LED Glasses (2/3): lyrics are synched with MusiXmatch, only showing the lyrics of long words (only used when playing "Harder better faster stronger" by Daft Punk); (v) LED Glasses (3/3): the glasses have been cut with the Trotec laser cutter. Musician 2: (i) Orphe (shoes): show the song onsets analyzed with EssentiaRT; (ii) GuitarHero: controls the bass track of the Paella song; (iii) R-iot (guitar): sound effects". The video recording of the hack presentation is [here](#).

- **Enboard** - by Steven Bolaños and Juan Felipe Gómez

"ENBOARD is an audiovisual experiment using a skateboard". The video recording of the hack presentation is [here](#).

- **Hi Note** - by Vahakn Matossian and Pere Calopa Piedra



“Accessible hands free wireless Midi controller instrument (aimed at, but not exclusively for, people with limited physical mobility or strength)”. The video recording of the hack presentation is [here](#).

■ **Flyte Club** - by John Murdoch and Pere Calopa Piedra

“A fresh social game based on a 5th century Scots tradition, Flyte Club is a sensory rap battle of techno sound as the audience vote passively with their mobiles. Download the Android development version here: www.untellect.com/FlyteClub”. The video recording of the hack presentation is [here](#).

■ **Tibetan Synths** - by Lucas Thompson, Carl Bussey and Béla Balázs

“We created a mobile application which uses the #MusicBricks realtime pitch detection algorithm to transmit pitch data from the live microphone recording to a desktop application via WiFi. The application, made using the Juce audio framework, then creates MIDI events which are then sent to a VST or AU synthesiser”. The video recording of the hack presentation is [here](#).

■ **Live gesture-controlled harmonica** - sampler by Corné Driesprong and Stacy Hsueh

“A real-time music performance tool that samples audio on the fly and plays it back to the user allowing one to play and improvise along with live input while manipulating the sounds. The audio input is pitch-tracked and segmented, then stored in a sampling buffer on the fly. Pitch transitions are recorded into a 2nd-order Markov chain in order to generate melodic material based on the previous input using the sampled audio. Gestural control using the Ircam Mo Motion Sensor allows the user to manipulate the pitch and playback speed of the recorded audio”. The video recording of the hack presentation is [here](#).

■ **Sound In Translation** - by Juanjo Bosch, Andres Bucci, Tim Schmele and Eros Blanco

“The idea for this hack is to explore the possibilities of assisted live remixing in a musical performance. Using a hardware controller the user creates a sound and the system searches for a similar sound and adds it to the inputs available for the remix process to start over. This process can continue as the performer listens and reacts to the new sound, finding relevant information within his/her music collection. Another performer can join in the conversation by using Bitalino Signals to control effects that alter the sound that is used for the search”. The video recording of the hack presentation is [here](#).

■ **Music Cocktail** - by Maria Panteli and Yading Song

“Mix your (music) ingredients and get a cocktail. A music recommendation system based on audio features (rhythm, timbre, melody, tempo) and metadata (year)”. The video recording of the hack presentation is [here](#).

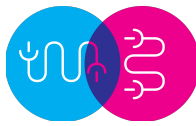
■ **ear we go!** - by Martin Hernant, Angel Faraldo, Dani Gómez and Cárthach Ó Nuanáin

“Bionic ear to help musicians get in tune with an existing musical ambience. This will simplify the way you jam and improvise with other musicians. Just press a button to listen and your sampler/synthesizer will be auto configured to be in tune”. The video recording of the hack presentation is [here](#).

■ **Nao Music Dance** - by Helena Bantula, Helena Cuesta and Eduard Frigola

“Making Nao robot dance according to an audio beat which is modified through gestures in real time using Kinect”. The video recording of the hack presentation is [here](#).

From the above-mentioned list of hacks, four were also using RAPID-MIX technologies in addition to the #MusicBricks, integrating and taking advantage of combining the most sophisticated tools developed by European research centres: ‘Roli Stoned’, ‘JucyPaintAlinoBrick’, ‘Tibetan Synths’ and ‘Sound in Translation’.



Finally, there was one additional hack developed by Xavier Salleras, Sergi Armengol, Nadia Campo and Clara Borrás which was started but not presented in the end which used #MusicBricks. The concept idea was related to an interactive installation emulating a tree built with wooden stickers which would have hanging mobile phones capable to synthesize sounds depending on the gesture/body movement of the performers. The technologies used were R-IoT, Maximilian, OSC, OpenFrameworks and MaxMSP.

As at the previous Creative Testbed events the #MusicBricks team rewarded the most promising ideas and hacks with a prize consisting of incubating them to the next stage prototype and facilitating further development.

The jury for the #MusicBricks hacks was composed of one member (with one vote) of every consortium partner attending the Music Hack Day, together with three invited external judges coming from other companies taking part in the event. The list of key persons that took part in the decision is as follows:

#MusicBricks partners:

- **Dr.-Ing. Jakob Abeßer**, Researcher in Semantic Music Technologies at Fraunhofer
- **Thomas Lidy**, Researcher at Institute of Software Technology and Interactive Systems (ISIS) of Vienna University of Technology
- **Cyril Laurier**, Senior Researcher in Music Information Retrieval at Stromatolite
- **Emmanuel Flety**, Project manager at IRCAM
- **Jordi Janer**, PostDoc at Music Technology Group (Universitat Pompeu Fabra)

Guest judges:

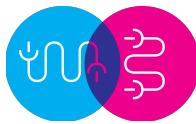
- **Ching-Wei Chen**, Engineering Manager, Content ID at SoundCloud (see more information [here](#))
- **Matt Johnson**, Bare Conductive Founder & Aspiring Polymath (see more information [here](#))
- **Gustavo Giudici**, Co Founder en Bastly (see more information [here](#))

The discussions and criteria that lead to make the decision on the winning hacks are summarised as follows:

- **Hi Note by Vahakn Matossian and Pere Calopa Piedra (Accessibility Instrument using the Ircam R-IoT sensor)**

This was the most convincing demonstration and a very clear winner for the jury. It is a hands-free musical audio interface for disabled people or people with limited mobility. A wireless in-mouth musical controller combined with a motion sensor (IRCAM R-IoT) that tracks breath, bite pressure, tongue position, and head movements in several directions etc. The jury was really convinced by the demonstration but also by the engagement of the creators: *"They are already working on similar projects, so they seem to be committed to bring it further. They want to particularly develop it for their target users (disabled people), but it can also be used in music therapy and has a number of wider applications. As they were very much interested in the #MusicBricks Incubation program it only makes sense to award them for this program."*

- **Ear we go! (SaaS using the Essentia library by Music Technology Group, UPF):** Also very clear winner for the jury: the jury was impressed by the convincing presentation and the chain of #MusicBricks analysis tools that are used to generate the result (Beatport - BPM - Essentia - Key - Juce - extract features - create loops). An acoustic guitar (or any other instrument) controlling loops to play along was considered a very nice idea. Though a lot of technology in the background, the idea is simple to



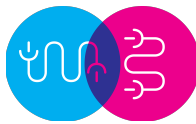
understand and a lot of fun: *"This has a lot of potential in the consumer market: Music participation for beginners - you can jam alone, find new music, or people to jam along with. This project will clearly benefit from #MusicBricks incubation and has a great potential in the consumer market."*

- **Sound in Translation (music instrument for generating samples** using TU rhythm timbre + Fraunhofer transcriber): It was a bit of a difficult decision because the demo setup did poorly work and it was hard to get the essence. The jury however liked several aspects of it: *"First, because of its novel innovative idea to generate and map sound samples on a MIDI matrix board: each time the musician plays samples in a row, the next matrix row is populated by sound samples sourced from songs found via audio analysis, music similarity, onset detection and beat mapping. Second, because it uses a clever combination of #MusicBricks. Also the idea of playing the 'Snake' game on the matrix board to generate sounds was nice. The entire setup seemed a bit overkilled and not quite finished. But in the end this has a lot of potential if polished during the incubation period, because a) it can benefit a lot from the #MusicBricks tools and proper know-how that is put into it and b) it has the potential of both becoming a commercial product and being used in performances."*
- **Enboard (combining extreme sports and music** using the Ircam R-IoT sensor): Although the demonstration had difficulties in getting set up the jury really liked the simple idea of putting a gyro-sensor and accelerometer (IRCAM R-IoT device) under a skateboard and enabling so many things with it: *"The short demo showed how it triggers / creates sound and also very compelling visual output. In the first moment it looked just cool. The usefulness was discussed; the jury saw that this is extendable in many ways and has a lot of potential: detect moves, select or transform music depending on analysis, combine with the smartphone via app over Wifi or bluetooth; create visuals / video while skateboarding, etc. - or even combine with Orphe shoes. There is a lot of open room for much more ideas and applications."*

3.7.Results from #MTFCentral

There were 50 places in the [24-hour hack camp](#) at #MTFCentral for the most talented creative developers who had access to exclusive new #MusicBricks technology and to micro-finance for the best projects to incubate and further develop to commercial prototype. In order to ensure that ideas that start at Music Tech Fest go on to have a sustainable life outside of the festival, some great music tech minds joined to help choose those projects:

- [Graham Massey](#) is best known as a founder member of pioneering British acid house band 808 State with whom he still performs to this day. Graham also co-wrote and co-produced tracks for Björk, released on her "Post" album and has worked with many other artist and bands including Bit-ting Tongues who were signed to the famous Manchester label Factory Records. Graham has also composed music for film for the 2004 movie "It's All Gone Pete Tong".
- [Rolf Gehlhaar](#) is the son of a German rocket scientist, who emigrated to the United States in 1953. Rolf's career in music began after studying composition at Yale University and in 1967 he moved to Germany to become assistant to Karlheinz Stockhausen and a member of his performing ensemble. More recently Rolf is best known for his work with computer-controlled composition and he is currently Professor in Experimental Music at Coventry University, School of Art & Design.
- [Matt Black](#) is one half of the legendary electronic music duo Coldcut, and co-founder of the Ninja Tune label which has brought us the amazing talent of the Cinematic Orchestra, Bonobo and Amon Tobin. At Music Tech Fest we think of Matt as the "godfather of our festival" - he has been with us right from the start, premiered Ninja Jamm at the first fest, engaged some of our community in building the app, and has been demoing new ideas at every fest since.



- [Nitin Sawhney](#) is a British Indian musician, producer and composer who writes music for film, television, video games and other media platforms, as well as producing his own album and single releases. Nitin is also well known for his acting appearances in shows such as “Goodness Gracious Me” and is currently composing the score for the upcoming movie “Jungle Book: Origins” due to be released in 2016.

These invited judges were joined by representatives of the #MusicBricks partners:

- TU Wien: Thomas Lidy, Alexander Schindler
- Sigma: Marta Arniani
- Stromatolite: Adam John Williams, Cyril Laurier
- Fraunhofer: Steffen Holly
- IRCAM: Frederic Bevilacqua, Emmanuel Flety,
- UPF: Alba Rosado, Jordi Janer

#MusicBricks Winning Hacks:

- **GIRD - Gesture-based Interactive Re-mixable Dance Floor (Interactive Dance Product** using the Ircam R-IoT sensor)

This team presented a project to create an immersive environment or dance floor to mix a series of stems (parts of songs) loops or samples using a gesture sensor and Philips HUE lights. The data produced from the gesture sensor manipulates the HUE lights and allows the user to change and interact with the music through movement. The lights change based on the emotional output of the song and also work as feedback for the user to help guide them through the piece of music. For example one light may get slowly dimmer throughout the song as a representation of the current point in the track duration.

- **Manuphonia (Music Learning Product** using the Ircam R-IoT sensor)

This team used the R-IoT board sensor module to recognise different hand gestures and connect them to different parts of a song. They used Max IDE to retrieve the data from the sensor and wrote a program that routes different hand gestures to the different parts. By connecting different gestures you can then construct an entire song through movement alone.

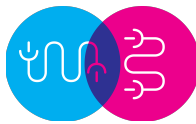
- **Hue-wee jam session (Generative Music and Light** using the Ircam R-IoT sensor and Philips Hue Lighting)

This project used a range of audio analysis tools to enable Philips Hue lights to react to music that is played during a jam session or performance. The system detects factors such as pitch, loudness and even the amount of notes being sounded at any time and changes the colour and intensity of the lights accordingly. Furthermore movement is also tracked, allowing for the whole lighting system to mirror the performance in both mood and frequency.

3.8.Results of #MusicBricks incubated projects presentations

A two hour session on the Sunday afternoon of #MTFCentral was reserved for presentation of the results of the #MusicBricks projects to date. All eight teams were represented, each giving an onstage presentation to the live #MTFCentral audience with the following results:

- **Aistrument** (Ariel Angel, Rani Dar, Matan Berkowitz)



The team presented their idea to extract musical context from a song, and create an interactive environment that corresponds to the musical context. They originally hoped to show two playing modules using two sensors, one for the foot, and one for the hand, however only the hand one was functioning for this demonstration. Some significant progress was made but more work needed to be done to make Airstru-ment into a viable prototype.

■ **Dolphin** (Rojan Gharibpour)

Excellent progress was demonstrated from the initial concept shown at #MTFScandi in terms of stability and usability. Using head nods to access different menu options, the development of Dolphin required highly difficult mapping programming which had been perfectly implemented. This demo showed Dolphin to be a stellar product with clear capabilities for marketing and potential application across a range of sectors from fitness to gaming.

■ **Bionic Ear or Ear (previously known as 'ear we go!')** (Cárthach Ó Nuanáin, Ángel Faraldo, Martin Hermant, Daniel Gómez)

Ear, designed to help musicians get in tune with existing musical ambiances, was presented in a polished demo that displayed its capabilities very well. The products potential for gaming and learning was clearly shown and the system was close to being a finished and solid prototype.

■ **Enboard** (Juan Felipe, Gómez Steven Bolaños)

The potential of Enboard, a skateboard set-up that uses the R-IoT board gyrosensor and accelerometer to create sound and compelling visuals mirroring the skaters movement, was clear as a highly fun and marketable device. However, limitations of the presentation stage area size at #MTFCentral, technical issues and lack of general project progress meant that the demonstration did not best display this devices potential.

■ **FindingSomethingBondingSound** (Francisco Teixeira, Horacio Tome-Marques, Fanni Fazakas)

Although starting with a slight technical hitch, once underway, this teams performance had clearly progressed significantly since its initial showing at #MTFScandi. Improvement had been made to all facets of the presentation including audio, video and choreography and the excellence evident in the fields of creativity and technical ability was highly impressive.

■ **Hi Note** (Vahakn Matossian, Pere Calopa Piedra)

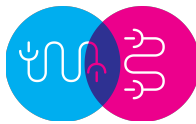
This was a very early product demonstration in this projects lifeline which only began a couple of weeks before the presentation at #MTCentral, however some good progress was demonstrated. Unsurprisingly not all elements worked perfectly but this highly motivated team were able to show the potential of Hi Note with a solid presentation.

■ **Interactive Cube** (Balandino di Donato, Per-Olov Jernberg)

Despite technical and logistical problems affecting the Interactive Cube team through much of the project timescale thus far this was a solid presentation and a good working prototype was shown. This was a more stable and user friendly device than previously seen with the addition of secure casing and a touch screen. Some more work was required though to bring the product to a finished state.

■ **Sound in Translation** (Juan José, Bosch Vicente)

Sound in Translation, which facilitates live remixing by finding new sounds to replace old ones, showed significant progress from its first concept demonstration at #MTFScandi. The product functioned extremely well during the presentation and only required some further user journey testing to tweak parameters and iron out any final glitches.



3.9. Results from Waves Vienna Music Hackday

Out of the seven hacker projects that were created at the Waves Vienna Music Hackday, three used the R-IoT #MusicBrick for gesture control and one used the #MusicBricks Transcriber. The remaining projects did not use #MusicBricks because of any obstacle, but because they had their own strong ideas in mind already.

The first Waves Vienna Music Hackday resulted in Seven hacks to be presented at the end of the hackday:

■ **MORE ør LESS:**

The AIR instrument jam session, using air instruments like drums made by the R-IoT gesture sensor, textile pads with a LilyPad wearable sewing kit, air guitar with flex sensors and accelerometer. A team consisting of two teams originally; both of which had worked independently at #MTFCentral. Here they joined forces and came up with a wearable prototype of a jamming instrument.

■ **Tenori-On Madness:**

A small sample-based instrument built in Supercollider that can be controlled by the Tenori-On via Midi.

■ **LightBeat:**

A project that uses the WiFi connected "Philips Hue" LED light bulbs to visualise music playing from a mobile device. By incorporating the Fraunhofer Transcription Software from #MusicBricks, Light Beat generates a visualization for the track provided, which is streamed to the light system live.

■ **Sound Shaolin:**

A crazy performance which uses IRCAM R-IoT's accelerometers to convert 3D arm and hand motion into sounds with a MaxMSP patch.

■ **GIRD - Gestural-based Interactive Remixable Dance Floor:**

An extension of a hack that was previously awarded at #MTF Central, to remix music and control lights through dance. This gestural based interactive dance floor experience allows a performer or audience members to interact with music in an immersive environment where the lighting plays a vital role. In this incarnation of the hack, the Hue lights were replaced by all new LED strips.

■ **SONØR:**

An electro-acoustic instrument which is played by two performers and uses everyday objects (such as metal boxes from the kitchen) as its own resonant body. Excited by the players voice, the objects reproduce the sound enriched by their own resonant characteristics.

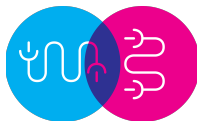
■ **Infinite Granulator:**

A distributed, Android-based sound cloud synthesizer. Using common, off-the-shelf audience Android smartphones, Infinite Granulator creates a huge, immersive sound cloud based upon granular synthesis, controlled by the performing artist or the audience itself (using accelerometer in the phones etc.)

#MusicBricks winning hack ported over from TU Wien winner Alexander Schindler:

- **(Project LightBeat (Generative Music and Light using the Fraunhofer #MusicBricks Transcriber and Philips Hue Lighting)**

From the three projects that used the R-IoT gesture sensor board, two had experience with it already from previous Creative Testbeds (the Music Tech Fest events), however all three of them experienced some ob-

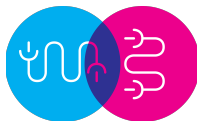


stacles in setting it up with the correct Wi-Fi configuration so that the boards would communicate with each other and the host. The feedback was gained that it could be made easier to setup the Wireless configuration and reconfigure the boards (especially in an environment when multiple projects in the same room use the boards, so conflicts with IPs and channels need to be avoided).

Project Sound Shaolin, that was novel to both this kind of event (a music hack day) and the gesture sensor board, had various comments. For them, it was a steep learning curve to a) set up the device and b) to receive its signals and make use and meaning of it. However, once they got set up and had signals coming in they were really satisfied with what they could achieve and were fast to progress and develop their idea: a performance with very swift and hard kick gestures, with a R-Iot gesture sensor attached to each hand and also a foot, that would create kick and swift sounds like in a Shaolin fight (also resembling vintage computer games). Their feedback to the #MusicBricks team was to work on easing the learning curve to enable future hackers and makers to be able to elaborate playfully on the device at an earlier stage of adoption.

The project LightBeat was offered a #MusicBricks incubation programme due to its innovative combination of the Fraunhofer #MusicBricks Transcriber with the "Philips Hue" WiFi connected LED system in which they programmed a delay in the audio + transcriber system to account for the latency in the LED system. Thus, LightBeat became the 11th nominated project for the #MusicBricks Industry Testbed.

More details about the hacks from Waves Vienna Music Hackday can be seen at <http://www.hackathon.io/waves-vienna/projects>



4. Conclusions

The Creative Testbeds provided a platform for creative seed ideas to kickstart the innovation process. The four events allowed for the unleashing of new creativity and concepts via the #MusicBricks toolkit and resulted in eleven projects with market potential as products or content, and deemed portable to other audiences, users, networks or locations, being adopted for incubation.

The testbeds have notably achieved high numbers of participation, quality engagement with rapid knowledge transfer, and a range of seed ideas including lifestyle products, interactive IoT-driven interfaces, accessibility and SaaS. A first transversal experiment joining the music industry with the lighting sector has also yielded potential for productisation.

The testbeds have also served as a test ground for the first batch of #MusicBricks prototypes, and provided the platform for co-creation between the #MusicBricks incubatees and the partner research teams, enabling the recording of feedback informing the refinement of the interfaces in WP3 and WP4 and the observation of methodologies developed during the course of the creative idea-generation activities and data gathering.