# schwittlick__

Hi! My name is Marcel Schwittlick.
I can support your project with consulting and
programming skills in C/C++, C#, Python, Java,
Javascript. I have experience with the frameworks
Unity, openFrameworks, Processing, OpenGL/GLSL,
OpenCV, LibAVG, JUCE among others. Moreover, I
have worked on projects using machine learning,
custom electronics and complex hardware/software
systems. And I love giving workshops on these
topics, too. To see my professional portfolio,
please have a look at the following pages. Feel
free to contact me at info@schwittlick.net or call
me at +491727262729. To see my artistic portfolio
have a look at https://schwittlick.net

Thank you for your attention.
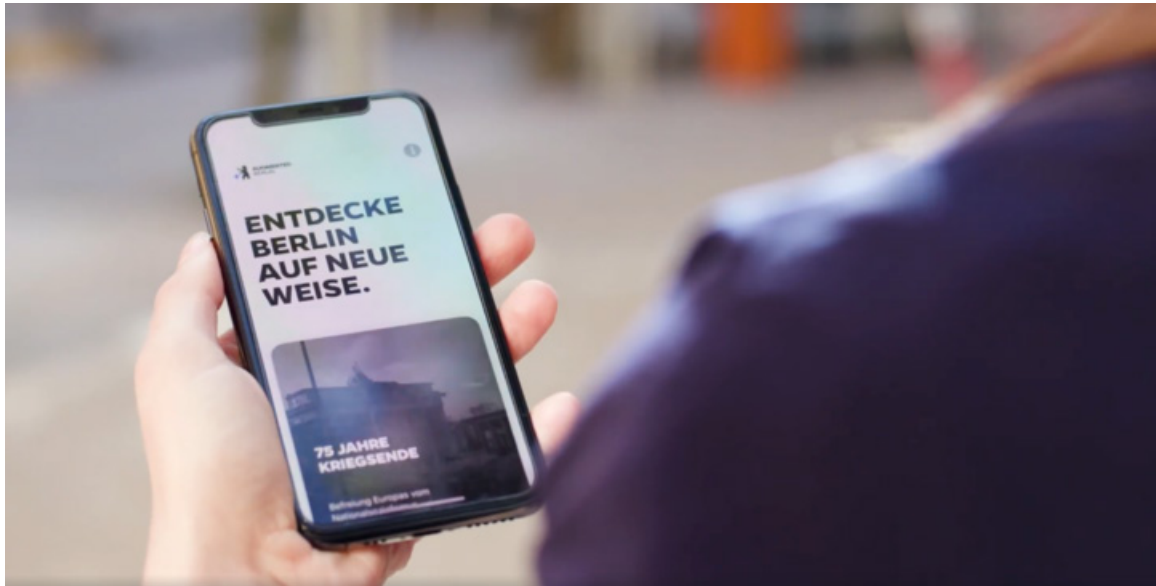
Client: BetaRoom UG / KULTURPROJEKTE
<u>AUGMENTED BERLIN</u> ANDROID APP(2020)

In close collaboration with the iOS developers, I was re-
sponsible for developing the Android Version of the Augmented
Berlin App. An Augmented Reality app that playfully tells the
story of various historic moments and sites of Berlin.

Keywords: Unity, C#, Augmented Reality

https://www.kulturprojekte.berlin/projekt/augmen-
ted-berlin/
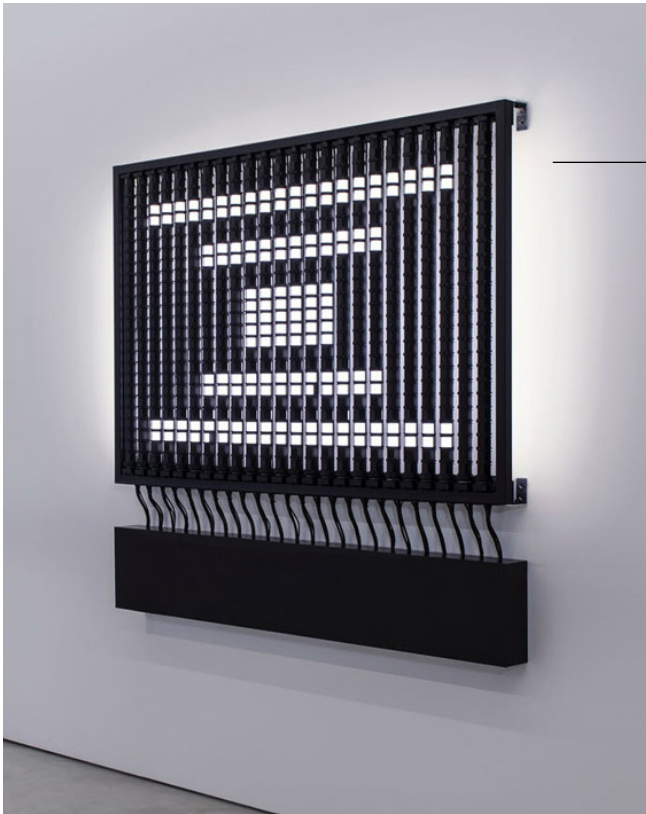
Client: Onformative

true/false (2012/2013)

True/False is a kinetic sculpture composed of arrays of circular black metal segments set in mechanical columns. Interlocking and rotating around fluorescent light tubes, the cylinders cover or expose the light to display an endless number of patterns. My work for this art slash design project interdisciplinary, ranging from software development in Java and Arduino to physical prototyping with AutoCAD and 3D-Printing. This installation displays the Google Analytics data of the Onformative website in real-time.

Keywords: Arduino/C, Java, Electronics, Neon Tubes, Stepper Motors, Parametric Design, AutoCAD, Google Analytics, 3D Printing, Seven Segments Display.

Client: Micropsi Industries GmbH

Micropsi Editor Shell (MESH) (2018/2019)

Machine learning for industrial robots. An AI-based, sensor-driven, real-time robot control system. Learning a MIRAI skill means training a neural network to generate the right movements and forces when presented with a configuration of images and sensor readings. My work for focuses on developing the visual programming language for the machine learning backend, a node-based graphical interface written in C++ and OpenGL to connect sensors with corresponding ML algorithms.

Keywords: C++11/14, JUCE 5, Python 3.5, OpenGL, Websockets

Client: NEEEU Spaces GmbH & Deutsche Zentrum für Luft- und Raumfahrt

VITA (2019-2020)

For this medical project I have co-developed an immersive virtual reality (VR) environment in Unity. Within the small team of 5, I was resposible for developing the interactive elements of the experience as well as integrating all sensors and devices. This project's purpose is to assist the therapy of phantom limb pain patients and stroke patients by re-enabling their impairment.

Keywords: Unity, C#, Myo Bracelets, HTC Vive, Virtual Reality

https://neu.io/projects/dlr_vvita

Client: PCH Innovations GmbH
<u>Jewelry Detection</u> (2019)

For this project I have developed a machine-learning based
object detection system for jewelry. An automatic pipeline to
record training data, annotate this data and train a robust
detection system. The objects were mostly made of reflective
and shiny material, a big challenge for computer vision sys-
tems. Moreover it was challenging to make the model robust
enough to detect jewelry in various positions.

Keywords: Python, turicreate, iOS, C++, Openframe-
works, Big-data, Machine Learning

Client: Archimedes Exhibitions GmbH

Science Center Ostrava (2014/2015)

This science center exhibition in Ostrava, Czech Republic consists of more than 130 interactive and multimedia exhibition pieces. Using Python and C++, I have developed these screen-based as well as physical installations. Apart from software development I was responsible for server administration and the physical setup on-site. I have updated new versions of the applications remotely via the internal remote-deployment system.

Keywords: Interactive Media Software, Python 3, Kinect, LibAVG, C++, Custom Projection Mapping Software, SysOps, Server Administration, Remote maintenance

http://www.archimedes-exhibitions.de/projects/exhibitions/OSTRAVA

Ey Alter | Mercedes-Benz (2015)

This educational exhibition on the topic of the demographic change was initially opened in Bremen, then moved to Stuttgart and Berlin. I have developed interactive and durable multimedia exhibitions. One challenging aspect was the main piece, an 2x-4K interactive particle system controlled via two LIDAR-scanners.

Keywords: C++11, openFrameworks, LibAVG, LIDAR Scanner, Interactive Media Software, Python 3, Custom Projection Mapping Software, Sysops, Server Administration, Remote Maintenance

http://www.eyalter.com
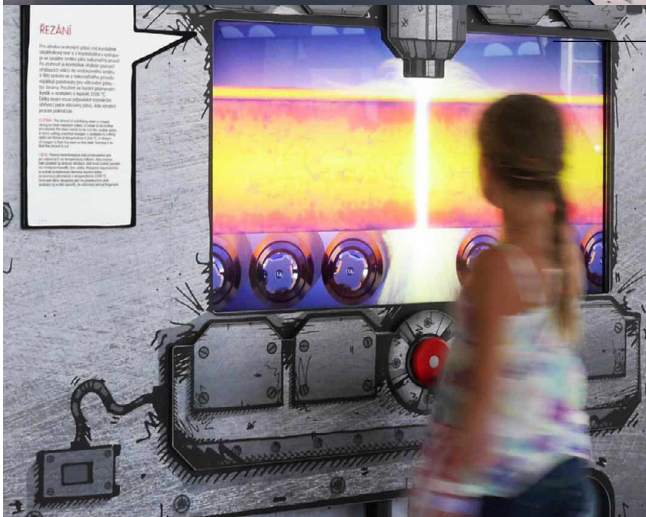
Journey of Streel (2015)

This exhibition in Ostrava, Czech Republic is not static but uses an interactive and dynamic approach. Using Python and C++, I have developed these screen-based as well as physical installations. Apart from software development I was responsible for server administration and the physical setup on-site.

Keywords: Interactive Media Software written in Python 3, LibAVG, Custom Projection Mapping Software, SysOps, Server Administration, Remote maintenance

https://www.plotmag.com/blog/2015/10/journeyofsteel/
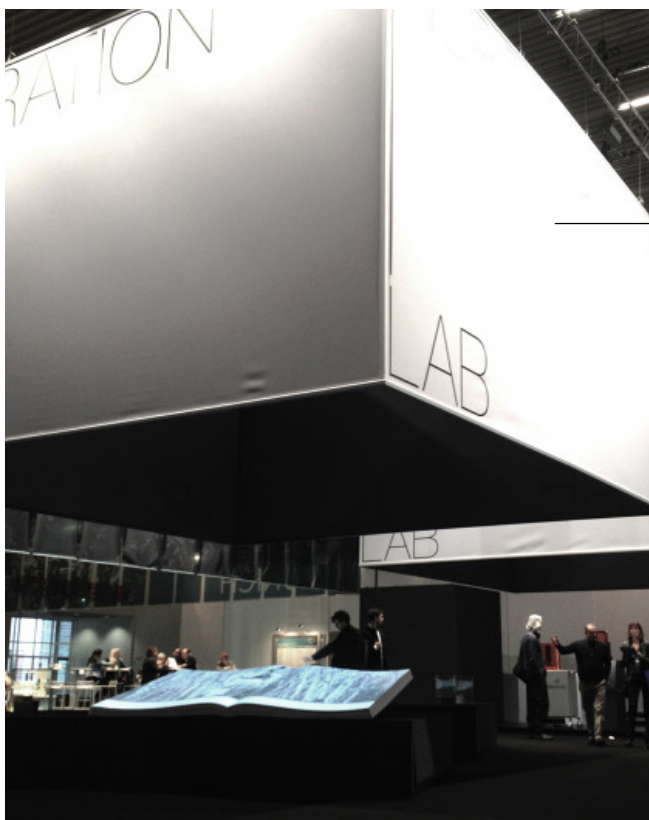
Client: Yves Peitzner

Interactive Magazine (2016)

A larger-than-life wooden magazine acts as a projection screen for multimedia content. Visitors can browse through the content via body gestures. The pages magically turn as you swipe your hand through the air. Content can easily be added, removed or updated via custom-made software and content management systems. Pictures, movies, animations – any form of multimedia content can be displayed. I have developed the software from beginning to end. Including a licensing model.

Keywords: Kinect V2, GStreamer, C++11, OpenFrameworks

Client: GSP GmbH

Passenger Information System (2017)

GSP creates large scale distributed real-time customer information software-system for trains. I have supported them for some months for the new software for the SBahn in Hamburg, writing lock-free concurrent and multithreaded systems for the train-internal signal distribution. Working with a 30-year old 500.000 LOC C++ codebase.

Keywords: C++11/14, Qt5, Test Driven Development

www.gsp-berlin.de/en/

Client: Flora&Fauna Visions

Adidas Gazelle Backyard Gallery (2016)

For the Adidas Showroom in Berlin I have worked with Flora&Fauna Visions on a kaleidoscopic media installation. A C++ application to play certain videos and share the photos to social media.

Keywords: C++11, OpenFrameworks, OpenGL, Touchscreen Interface, Social Media Sharing

http://florafaunavisions.de/portfolio/a-kalei-doscopic-experience-adidas-gazelle-backyard-gal-lery/

Audemars Piguet - Super Sonnerie (2016)

With Flora&Fauna Visions I have developed an audio-reactive visualization iPad-App for the showroom of Audemars Piguet. The visitors of the exhibition can use an external high-quality microphone to capture the sounds of AP's watches. It was a big challenge to distinguish between very subtle differences in the audio signal from the ticking of the watches.

Keywords: C++11, OpenFrameworks, OpenGL, iOS Development, C++ Audio and Music DSP Maximilian

Client: Flora&Fauna Visions

Electronic Beats Exhibition | Deutsche Telekom AG (2016)

Interactive Audio-Visual Installation with projections onto several semi-transparent surfaces. The generated sounds and visuals are based on the interaction with the visitors. The self-created work can be instantly uploaded to several social media channels. The interaction was supported with paper sheets that can be marked with a pen. These markers are detected with a webcam and turned into an audio-vision composition.

Keywords: C++11, OpenFrameworks, OpenGL, OpenCV, Social Media Sharing from C++

http://florafaunavisions.de/portfolio/electro-

Overflow | Toyota C-HR Festival (2017)

Interactive Audio-Visual Installation with projections onto several semi-transparent surfaces. The generated sounds and visuals are based on the interaction with the visitors. The self-created work can be instantly uploaded to several social media channels. The interaction was supported with paper sheets that can be marked with a pen. These markers are detected with a webcam and turned into an audio-visual composition.

Keywords: C++11, OpenFrameworks, OpenGL, OpenCV, Social Media Sharing from C++

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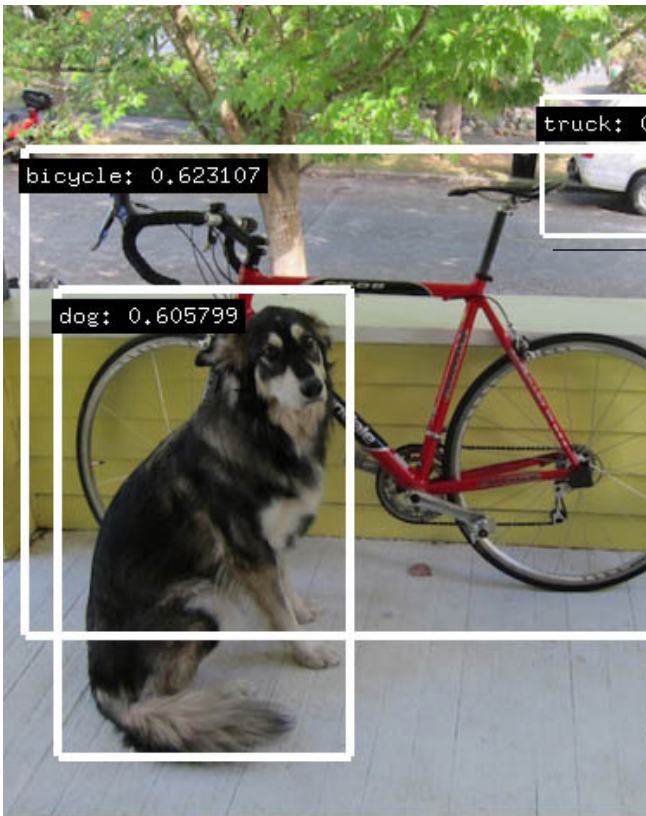
Open Source Library

ofxDarknet (2017)

A openFrameworks wrapper for darknet.

Darknet is an open source neural network framework for machine learning written in C and CUDA. It is fast, easy to install, and supports CPU and GPU computation.

Keywords: C++11, OpenFrameworks, Machine Learning, Object Detection, Image Classification

Bachelor Thesis

Realtime Computer Vision System (2013)

A network camera is observing the Spree river in Berlin. With this software, all boats and ships are being recognized and monitored, independent of the weather and light conditions. Using Computer Vision and a custom GUI to control the parameters. During my thesis, I had the chance to learn and research the foundations of computer-vision.

Keywords: C++11, OpenCV 3.0 (GPU)

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Client: Mireia Saladriguez

<u>Virtual Present Tour | Venice Biennale</u>
(2016)

Virtual Tour is a recursive exhibition during the
Venice Biennale 2016. The piece is a Unity3D game
that reconstructs the very same exhibition. The
users can explore and modify the exhibition and
it's pieces in virtual.

Keywords: Unity3D, C#

Client: Julius von Bismarck

<u>VR Realtime Room Scanner</u> (2018)

Through the VR glasses, you see the point cloud
of the LIDAR scanner that is mounted to the
head. The point clouds are being merged together
dependent of the movement of the user in real-
time. Aligning the consecutive point-clouds of
the LIDAR-scanner when the head is a challenging
task, even using existing pointcloud-registration
libraries. My system worked in real-time with
very high accuracy.

Keywords: Realtime PointCloud Registration,
Samsung Odyssey VR Headset, Unity3D,
Velodyne VLP-16 Lidar Scanner, C++11/14,
PointCloudLib, OpenMP

Client: Annie Dorsen

The Great Outdoors (2017)

The Great Outdoors is a theater piece by NYC-based director Annie Dorsen. Her interest lies in algorithmic theater and I have developed and written a software system for this piece of 1h duration. The monologue of this piece was based on scaped conversations from reddit and 4chan.
The software I have written uses a custom python-motorway streaming architecture and NLP-technology to analyze scaped text and construct a story for the theater piece. Each performance was unique and based on text scaped on the day before the show.

Keywords: Python 3 text scraping pipeline (Reddit&4chan), Natural Language Processing
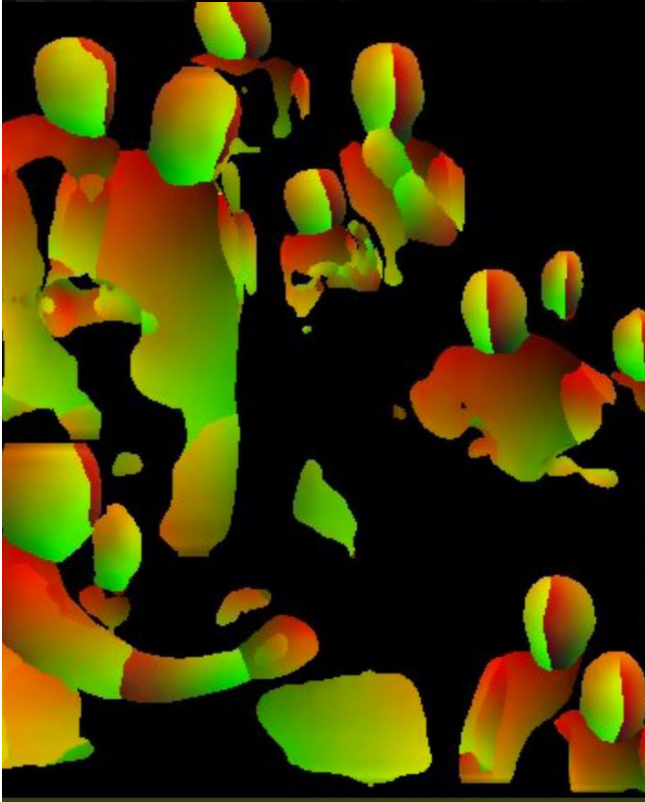
The Slow Room (2018)

The Slow Room will investigate the uncertain space between the virtual and the embodied, as well as the possible pitfalls of language itself. This theater piece is similar to "The Great Outdoors" and examines the text with a custom python pipeline. I am analyzing by entropy, word count, sentiment, sentiment and word-embedding similarity among other techniques.

Keywords: Python 3 Natural/Processing

https://www.artforum.com/news/annie-dorsen-

Client: Analema Group

<u>KIMA</u> **(2016)**

KIMA is a performance series that is playing with the visualization of sound by generating and modifying chladni-figures, caustics and fluid-simulations. The sound of singing-bowls and vocals are captured and analyzed in realtime. The visuals are generated on the spot. I have learned a lot about sound and it's analysis in this project.

Keywords: C++11, OpenFrameworks, Java, Processing, OpenGL, GLSL, Audio Reactive, Fluid Dynamics Simulation

https://analemagroup.com/projects/kima-at-in-
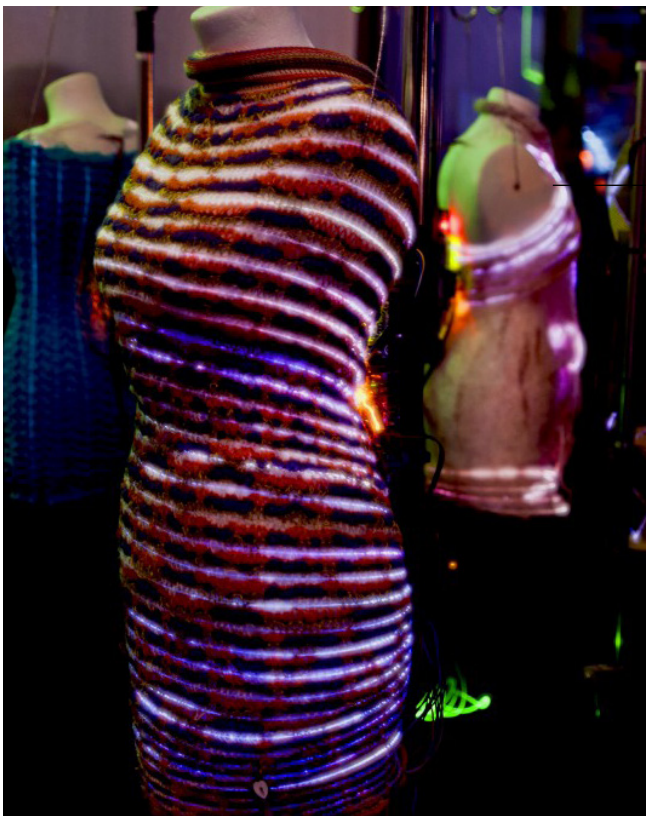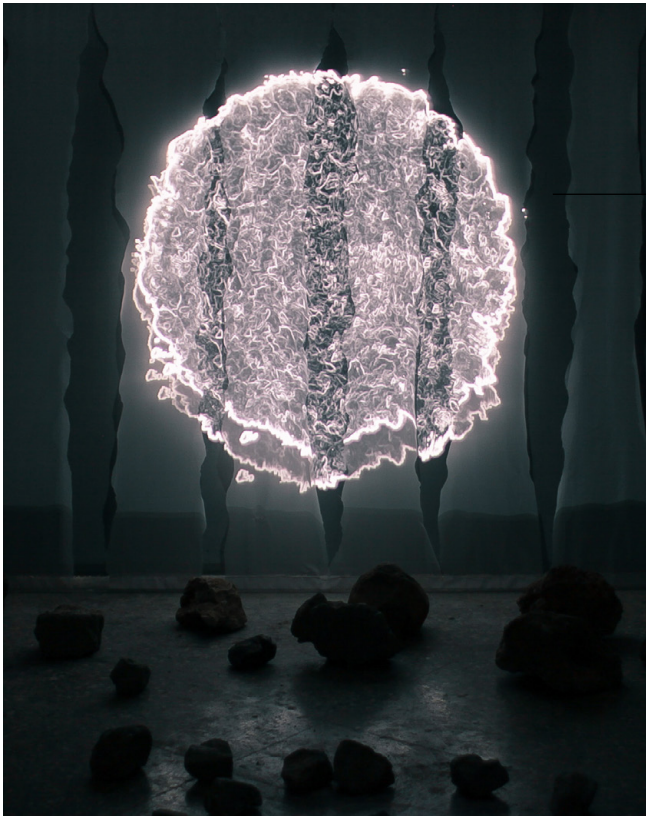

Client: Raune Frankjaer

<u>Lightning Bug</u> **(2014)**

„Lightning Bug" is an interdisciplinary design research project, investigating the application of light in the extension of interpersonal communication. A small but complicated decentralized network of XBee-Radios to control lights and sound. Microprocessor-programming is an challenging but interesting area.

Keywords: XBee Radio Communication (Point-to-Point), Arduino, Electronics

http://urbaninteraction.net/project-lightning-bug/ http://frankjaer.de/creating-wearable-networks-with-soft-circuits/ Link3: http://frankjaer.de/lightning-bug/

Client: Agnes Chavez

<u>Origination Point | Havana Biennale</u> (2015)

Origination Point is a generative interactive projection installation originally exhibited at the 12th Havana Biennial in Havana, Cuba. I have developed the Kinect V2 interaction and storylined generative visuals that explore the depth of materiality. Written in C++.

Keywords: Timelined Generative
OpenFrameworks graphics, Audio Reactive,
Interactive via Microsoft Kinect 2,
C++11, Detecting rocks placed in front of the
installation

http://agneschavez.com/xtreeprojectother-works/
origination-point/

<u>BIOTA (2019)</u>

BIOTA is a data visualization installation that explores biodiversity loss through the micro-macro lens of new sensing technologies. This bio-data was used to generate an algorithmic pattern of growing circles visualizing the diversity of species collected from the Rio Fernando and their relational abundance.

Keywords: Timelined Generative
OpenFrameworks graphics, C++11

http://agneschavez.com/biota/