

Yamaguchi Center for Arts and Media : Research and Development

YCAM InterLab Joint Research & Development Program

Guest Research Project vol.1 Projecter Camera Toolkit

(Researcher: Kyle McDonald / Residency period: August - November, 2011)

Related Exhibition: September 10 - December 25, 2011 Admission Free

Yamaguchi Center for Arts and Media [YCAM]

The beginning of a full-scale research and development program at YCAM. "Projecter Camera Toolkit" integrating technologies related to media art and computer vision.

The Yamaguchi Center for Arts and Media [YCAM] invites engineers and researchers focusing on cutting-edge subjects related to media art, to participate in the "Guest Research Project" and work on joint projects with YCAM's own "InterLab" research and development team.

In this first installment, New York-based engineer/artist Kyle McDonald will stay and work at YCAM for about three months. His joint research at the Center will revolve around "calibration" technology as used in computer vision, and culminate in the presentation of a "projecter camera toolkit" developed during that period. The program aiming to redevelop a very specialized technology into a system with broader utility, and showcase the results in the form of software, will at once expand the range of technical application, and stimulate further development in film and video.

In tandem with the research program, two works realized with McDonald's participation are on display at two separate locations at YCAM. This first full-scale research and development program at the Center is designed to explore new possibilities in media art, informed by creative and expressive means, enhanced by technology.



DIY 3D Scanning

Related Exhibition:

September 10 - December 25, 2011 10:00-20:00

At two locations inside the YCAM building Admission Free

The Janus Machine

Kyle McDonald, Zach Lieberman, Theo Watson, Daito Manabe

I Eat Beats

Kyle McDonald

INQUIRY

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Joint research and development with internationally operating engineers

The Guest Research Project was launched in 2011 as a new full-scale research and development program at YCAM. Engineers and researchers focusing on cutting-edge subjects related to media art are going to stay at the Center, and engage in joint research together with members of the YCAM InterLab. The idea behind this program is to further improve and activate the functions of YCAM in the production of new artworks. In addition, by externally publishing the results of the research and development work in the form of software and tools, we aim to establish a platform for communication among engineers around the world, and facilitate exchange regarding the newest available technologies and novel forms of expression.

The first installment features Kyle McDonald, known for initiating the "DIY 3D Scanning" project designed by means of open-source software that can be used for the three-dimensional measurement of objects. In the course of his research and development during his stay at YCAM, McDonald will apply this technology with the aim to develop a "projector camera toolkit" to be used for calibration, and position/color adjustment technology required for large-scale video projections.

The "Projector Camera Toolkit"

Calibration - an indispensable function for the diversification of film media

Projection mapping is a form of imagery that is attracting attention in such fields as media art and interactive advertising. This technique projecting images onto architecture and other three-dimensional objects instead of screens makes it possible to utilize the textures and structures of the respective object (medium) for dynamic orchestrations of visual ideas in real spaces. Calibration is one essential technology for the realization of this type of imagery. In the joint research and development at YCAM, Kyle McDonald investigates into calibration systems using cameras and projectors, and devises a "projector camera toolkit" - software combining helpful features for producing scrupulous visual compositions specifically for three-dimensional surfaces.

A calibration tool based on 3D scanning technology

Kyle McDonald developed software for measuring objects three-dimensionally utilizing an ordinary projector and digital camera. Using the software this 3D scanner works with makes it possible to measure the objects of projections three-dimensionally, and reconfigure/recalibrate projected images. The new systems of simplifying and developing existing technologies that are worked out here promise to enhance the application of technology, and open new avenues for creativity in film media.



* YCAM InterLab

Research and Development Team

The YCAM InterLab is a team of researchers and developers with particular expertise in media art, integrated in the Yamaguchi Center for Arts and Media [YCAM]. Specializing in the development of technologies for the production of installations and performing art works commissioned by YCAM, the InterLab members cooperate with artists and external engineers to provide technical support for the realization of artworks. Next to research and practical attempts in implementing leading-edge technology in the realm of art, they engage actively in various collaborative research with specialists invited from all parts of the world, with the aim to establish human networks and facilitate exchange among the technical departments of cultural facilities, while continually expanding their area of investigation.

<http://interlab.ycam.jp/>

Media art integrating advanced techniques, ideas and creativity

Kyle McDonald, who will stay and work as a guest researcher at YCAM, has been producing works informed by a combination of advanced technical skills and expertise in the fields of art and science, and participated in a number of rather extensive projects. His international reputation is primarily based on his achievements in the realm of software development, where he has been modifying cutting-edge technologies for use in highly versatile systems. As part of the Guest Research Project, YCAM exhibits two works in which McDonald demonstrates his exquisite combination of an inquiring mind regarding technology, and distinctly playful sensitivity. Aiming to introduce the fruits of the joint research and development efforts to a broader audience, we are further planning to exhibit works implementing the newly developed technology.

About the Researcher

Kyle McDonald

Media artist

<http://kylemcdonald.net/>

Born 1985, based in New York. His work ranges from experimentation with noise and glitch to immersive large-scale interactive installations; from alternative sensor design to conceptual art. His time is divided evenly between creating new work and creating new tools, developing open source software and hardware for, and in collaboration with, other artists. McDonald has a background in philosophy, computer science, and electronic arts, with a Bachelors of Science and a Master of Fine Arts from Rensselaer Polytechnic Institute. He is one of the most active developers behind the "openFrameworks" open-source software development environment, and is deeply involved in the international openFrameworks community.



Previous work



DIY 3D Scanning (2009)

3D scanner for three-dimensional measuring of objects. This normally expensive and specialized device is being developed for use for various purposes. Kyle McDonald devised software for building an apparatus that functions like a 3D scanner using nothing but an ordinary household projector and a digital camera. The software was made public via open-source, and became noticed as one of McDonald's most well-known projects.



Night Lights (2009)

Large-scale projection mapping event conducted over five days in Auckland (New Zealand). As a project member, McDonald was in charge of interaction design and software development. Images projected onto a wall dynamically changed according to three different types of interaction - movements of participants on a stage, hands put on a light table, and GPS data transmitted from mobile phones.

Exhibited Works**The Janus Machine** Kyle McDonald, Zach Lieberman, Theo Watson, Daito Manabe

2010 | installation

This is a work in which facial expressions of visitors and other persons are synthesized into three-dimensional images of faces that change their appearance in various ways. The mechanism of generating images by processing three-dimensional measurement data of faces is based on the "DIY 3D Scanning" open-source software that McDonald developed in 2009.

The contours of the face of a visitor sitting on a chair in the exhibition booth are scanned in a shower of light, and translated into a three-dimensional rendition of him/her. The generated image appears on a screen in the back, where it is synthesized with data stored in a computer, and ultimately transforms into a variety of new expressions, including those of (previously recorded) other persons that can be of different age or sex. "Janus" in the title refers to the double-faced god and guardian in Roman mythology, and the notions of transition and duality - come/go, past/future, young/old - it implies. Seemingly proposing new interpretations of ancient myths and metaphors, the work highlights the boundaries between the self and others, the past and the future.

Venue: [gallery second floor](#)Equipment cooperation:
Color Kinetics Japan Incorporated**I Eat Beats** Kyle McDonald

2008-2009 | installation

I Eat Beats is a percussion instrument that can be played by placing candies as "musical notes" onto lines projected onto the top of a table, resulting in a limitless variety of rhythms. The work was first unveiled as a prototype using such simple devices as a web camera and computer, combined with image-recognition technology. It is easy to play for anyone, and allows for ensemble performances by multiple players at once. This original electronic instrument that can be enjoyed while eating candies reflects McDonald's playful approach juxtaposing innovative ideas and techniques, and can be considered as a prototype tangible user interface.

[As part of the exhibition at YCAM, visitors can try and play the "nstrument" using similar objects.]

Venue: [gallery first floor](#)**Project data****YCAM InterLab Joint Research & Development Program****Guest Research Project vol.1 - projector camera toolkit**

Researcher: Kyle McDonald (Media artist)

Residency period : August - November, 2011

Related Exhibition

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The Janus Machine

Venue: gallery second floor

I Eat Beats

Venue: gallery first floor

Organized by: Yamaguchi City Foundation for Cultural Promotion
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Co-developed with: YCAM InterLab
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