Creative Coding and Interaction Design for Media Multiplicities: Challenges, Paradigms and Frameworks

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ABSTRACT

Media multiplicities are media artworks that employ multiple networked digital devices to create holistic aesthetic effects. Examples include the networked light artworks of Squidsoup, the Spaxels drone-mounted light performances, DrawBots, Siftables and many others. In multiplicitous media artworks, each individual device is a programmable node connected to other nodes via a network connection, and may combine any number of sensors and actuators. A number of development

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technologies support artists and designers to configure and create media multiplicities, but this domain offers new challenges for creative practitioners. This workshop aims to bring together experts in creative coding and interaction design to discuss and conceptualise frameworks for the practice of media multiplicities. Open challenges include: speed of setup; ease of hardware configuration; speed of code deployment; ability to model and simulate works in VR; network connectivity and stability; and understanding network, computation and power constraints.

CCS CONCEPTS

• **Applied computing** → *Media arts*; • **Computer systems organization** → *Embedded systems*; • **Hardware** → *Sound-based input / output*;

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SCHEDULE

1-day workshop summary schedule:

- 09-11: Creative hacktivity introducing HappyBrackets development framework.
- 11-13: Extended abstract presentations.
- 13-14: Lunch.
- 14-17: Collaborative development workshop.

DETAILED PROPOSAL DESCRIPTION

Detailed Schedule

HappyBrackets creative activity

The workshop co-chairs will introduce the HappyBrackets creative coding framework and hardware. This is a framework that has been used in a number of creative artworks and performances, and taught in workshops and courses introducing creative internet of things. It targets the Raspberry Pi microcomputer but can work with any Linux-based embedded system. Participants will be given a rapid-fire introduction to how to write a simple interactive audio-visual program, to be run across multiple devices and their on-board speakers, lights and sensors. Participants will then engage in a group activity. The activity will stimulate reflection and discussion on the constraints and affordances of working creatively in a multi-device

Extended abstracts

Participants will be invited to submit extended abstracts (500-2,000 words) which address any of the topics listed in Section 1D. Abstracts and presentations will be invited to offer hands-on demos and to propose provocations and speculations about the design of multiplicitous media creative practice and support tools that will stimulate discussion.

Collaborative development workshop

A collaborative development session will take the day's learnings and discussion and focus on high-level abstract design concepts. Participants will be offered a number of design provocations, developed in advance and during the day, and will work in small groups on a chosen provocation, presenting their findings in a larger group discussion at the end of the day. Responses to topics are invited to be abstract or very specific, for example focusing on the minutiae of hardware or software designs or providing specific case studies of creative works, provided there is reflection on one of the given topics.

TOPICS TO BE COVERED

- What programming languages, coding tools, authoring tools and design patterns support creative multiplicitous media?
- What creative paradigms, workflows and ecosystems of practitioners best support creative multiplicitous media, and what are the emerging trends in creative multiplicitous media practice?
- Examples of multiplicitous media systems that are adaptive to site specific contexts or different applications.
- What are the pain points in creative multiplicitous media and how can they be mitigated or removed?
- What is the 'winning paradigm' for flexible and reusable hardware configuration that makes it easy for beginners to get started and for professionals to easily hack and reconfigure systems for their needs?
- How can simulation tools and smart adaptive systems support the creation of multiplicitous media artworks?
- What are the emerging application areas and affordances of multiplicitous media artworks and how are these impacting other areas such as the design of interactive media experiences in galleries and museums or outdoor public artworks?
- How can multiplicitous media work minimise its environmental impact?

LEARNING GOALS/DISCUSSION OBJECTIVES

Learning goals: participants will be brought up to date with the latest developments in media multiplicities, largely through sharing knowledge with each other. Discussion objectives will be aligned with the topics outlined in Part 1D. In addition the workshop will aim to build an international collaborative

community with a strong representation from local Sydney practitioners, who will develop shared goals and future partnerships.

SUPPORTING DOCUMENTS

This workshop is supported by the ARC Linkage grant "Artistically rethinking creative coding for digital media", a collaboration between UNSW, UTS, Bitscope Designs, Squidsoup, Casula Powerhouse and ArtworksrActive (represented by Linda Candy).

About the HappyBrackets creative coding framework: http://www.happybrackets.net.

See the following papers for further reading on the work of the authors: [1–4].

Figure 1: Squidsoup's *B*loom project, using a network of 1,000 custom made ESP32 boards with LEDs, speakers, WiFi and IMU sensors. London Docklands 2017.

REFERENCES

[1] Oliver Bown and Sam Ferguson. 2018. Understanding media multiplicities. *Entertainment Computing* 25 (2018), 62–70.

[2] Oliver Bown, Lian Loke, Sam Ferguson, and Dagmar Reinhardt. 2015. Distributed interactive audio devices: Creative strategies and audience responses to novel musical interaction scenarios. In *Proceedings of the 2015 International Symposium on Electronic Art, Vancouver, Canada.*

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