Randy Illum

Email: randy@remap.ucla.edu
Web: www.randyillum.com

Education

University of California, Los Angeles   Expected 2020
Doctor of Philosophy, Information Studies

Rutgers University, New Brunswick   May 2009
Bachelor of Fine Arts, *Summa Cum Laude*

Conference Proceedings

Keifert, D., Lee, C., Dahn, M., **Illum, R.***, DeLiema, D., Enyedy, N., & Danish, J. (2017, June). Agency, Embodiment, & Affect During Play in a Mixed-Reality Learning Environment. In Proceedings of the 2017 Conference on Interaction Design and Children (pp. 268-277). ACM. **Presenting Author*

Illum, R., & Dahn, M. (2017). Mixed-reality barriers: Person-tracking in K-12 schools. In 2017 IEEE Virtual Reality Workshop on K-12 Embodied Learning through Virtual Augmented Reality (KELVAR) (pp. 1–5).

DeLiema, D., Saleh, A., Lee, C., Enyedy, N., Danish, J., **Illum, R**., & Mahoney, C. (2016). Blending Play and Inquiry in Augmented Reality: A Comparison of Playing a Video Game to Playing Within a Participatory Model. Singapore: International Society of the Learning Sciences.

DeLiema, D., Lee, C., Enyedy, N., **Illum, R**., Dahn, M., Saleh, A., & Mahoney, C. (2016). Blending Play and Inquiry in Augmented Reality: A Comparison of Playing a Video Game to Playing Within a Participatory Model. In Proceedings of the International Conference of the Learning Sciences (pp. 450-457).

Munaro, M., Horn, A., **Illum, R.**, Burke, J., & Rusu, R. B. (2014, July). OpenPTrack: People tracking for heterogeneous networks of color-depth cameras. In IAS-13 Workshop Proceedings: 1st Intl. Workshop on 3D Robot Perception with Point Cloud Library (pp. 235-247).

Conference Presentations

Christine, L**.** and **Randy Illum.** (2016) *Body Tracking Technology and Play Based Learning for Science Education.* Museum Computer Network Conference. New Orleans, LA.

Illum, R. and Burke, J. (2016) *OpenPTrack: Body-Based Group Tracking for Informal Learning Spaces*. Museums and the Web Conference. Los Angeles, CA.

Enyedy, N., Lee, C., DeLiema, D., Danish, J., Saleh, A., Dahn, M., Peters, K., Morris, N., Thomas, C., Torres, R., Cardenas, G., Creek, C., Love, Burke, J., **Illum, R.**, Wagmister, C., Horn, A., Munaro, M. and Rusu, R. (2016). *Learning About States of Matter Through Multiple Correspondences Among the Body, Abstractions, and Reality.* American Educational Research Association. Washington, DC.

Dahn, M., Lee, C., Enyedy, N., Gravell, J., Burke, J., **Illum, R.**, Avetisian, H., Paul, L., Gomez, T., &

Torres, R. (2016). The Cybermural Project: Digital Learning for Early Childhood Science Inquiry. *American Educational Research Association Annual Meeting*. Washington, D.C.

Enyedy, N., Danish, J., DeLiema, D., Lee, C., **Illum, R.,** Saleh, A., Dahn, M., Peters, K., Morris, N., Thomas, C., Torres, J., Cardenas, G., Creek, C., Love, M., Burke, J., Wagmister, C., Horn, A., Munaro, M., Rusu, R. (2015). *Science through technology enhanced play*. Talk presented at the National Center for Research on Evaluation, Standards, and Student Testing, Redondo Beach, CA.

Invited Presentations

Illum, R. and Carraro, M. (2017). OpenPTrack, an Open Source People-Tracking Platform: Algorithms and their Implications for Human-Computer Interaction and Information. *UCLA Information Studies Pop-Up Colloquium Series*, Los Angeles, CA.

Illum, R. and Christine Lee (2015). *OpenPTrack and Interactive Design*. CheLA Art Center, Buenos Aires, Argentina.

Lee, C., **Illum, R.*,** Cardenas, G., Enyedy, N., Danish, J., Saleh, A., DeLiema, D., Dahn, M., Peters, K., Morris, N., Thomas, C., Torres, J., Creek, C., Love, M., Burke, J., Wagmister, C., Horn, A., Munaro, M., Rusu, R. (2015). *Science through technology enhanced play*. International Forum for Innovation and Education (FIED), Buenos Aires, Argentina. *Presenting Author.*

Peer Reviewed Technology Demonstrations

Burke, J., Fitz-Gibbons, T., **Illum, R.,** and Sandoval, Z. (2016) *Engagement, Creativity, and Technology: Research for the Future of Interpretive Media in Public Space*. Design Charrette and Technology Demonstration at InterpTech Conference. Monterey, CA.

Illum, R. and Burke, J. (2016) *OpenPTrack: Robust Open-Source Person Tracking For Creative Coding*. Museums and the Web Conference. Los Angeles, CA.

Burke, J., Murano, M., **Illum, R.,** and Sandoval, Z (2016) *Real-Time Person Tracking on Jetson with OpenPTrack*. Invited Demonstration GPU Technology Conference. San Jose, CA.

Fellowships

Graduate Student Mentorship 2017 – 18 $42,000
Graduate Student Research Mentorship 2017 $6,000
CONNECT Fellow 2016 – 17 $40,000
Graduate Student Research Mentorship 2016 $6,000

Editorial

Editorial Board:
Critical Planning Journal: UCLA's Urban Planning Journal

Research and New Media

Embodied Drawing in Group Environments (EDGE) – *Principal Researcher*   **2017**

For the 2016 – 2017 academic year, I was awarded A Center for Research & Innovation in Elementary Education's (CONNECT) Fellowship. Through this fellowship program I was funded to develop a comparative study investigating how collaboration, gesture, and affect change when students are using traditional methods of drawing in collaborative groups when compared to when students create collaborative digital paintings through an application I developed. The digital application consumes person-tracking data which then allows the students to paint through their movements in space. This research is in progress, but video will be recorded of the entire study for coding and analysis. Additionally, clinical style interviews will be conducted one-on-one with students to generate additional data on how the students' viewed their interactions and collaboration within each art-making environment.

Los Esteros del Ibera – *Technical Director* **2016**
I lead the team to develop and execute an interactive exhibit on Argentina's newly founded national park, Los Esteros del Ibera. This exhibit was showcased as part of Tecnópolis, Argentina's yearly technology and education fair. The exhibit supported up to fifteen visitors simultaneously - through each person's movements in the exhibit space, they could a control a video linked to their digital-self, and through collaboration with others in the space could control what background videos were shown. As the technical director, I designed and implemented the computer vision system that allowed for visitor interaction with the content, the immersive directional audio system, and the multi-projector display system. In addition to the design of the many sub-systems I also lead the onsite system construction and implementation.

NASA Jet Propulsion Laboratory: Deep Think Workplace – *Designer* **2016**
A future technology design study conducted by UCLA's think tank CityLab to develop speculative workspaces for NASA's Jet Propulsion Laboratory (JPL) with the goal to improve collaboration between team members during meetings. The goals of this project were to be accomplished through the unique integration and repurposing of current technologies, the use of emerging technologies, and through the redesign of existing spaces. My role in this project was to research technologies that could be used to enhance collaboration during meetings. Which also included designing collaborative workspaces within the existing building space, and creating designs for new modular structures that could be constructed on the JPL campus, both of which leverage emerging collaborative technologies and low power display systems.

Science through Technology Enhanced Play (STEP) – *Graduate Student Researcher* **2014 - Present**
An educational research project funded by a grant from the National Science Foundation (IIS-1323767). This project investigates how embodied play among elementary school students can be used to help them understand complex scientific phenomena through inquisitive learning methods. During my time as a researcher on this project I have contributed to the design of the pre- and post-tests, administered the tests to the students, and conducted structured interviews. I have am also part of the design team to develop the in class intervention. I have helped to guide the development of user interface for the researchers, and the student side user interface.

OpenPTrack – *Graduate Student Researcher* **2013 – Present**
This is an open source effort which has developed a scalable, multi-imager person tracking system aimed to support body-based interactive applications in education, the arts, and for cultural institutions. Previously as the program manager, and now as a researcher I have lead the development of the many specifications, infrastructure design, and the execution of the hardware and implementation the system as a whole. In addition I have also designed the specifications and usability features for the software development.

Interpretive Media Laboratory (IMLab) - *Project Manager* **2013 – Present**
Collaborating with California State Parks, REMAP is designing a new interactive Welcome Pavilion for the Los Angeles State Historic Park which will house IMLab. The goal of IMLab is to engage the surrounding community in documenting and sharing their area's history by using sensing and multi-media technology. I

have researched all aspects of the hardware to be used, supported the design of the center's main UI, and am currently managing the deployment of varying technologies, staff, and the outside collaborators of the project.

LASHP Trails - *Project Manager*   **2013 – 2015**
An offshoot of the IMLab project, LASHP Trails is a mobile website which focused on creating interactive "trails" around the LA State Historic Park that participants can find and explore through their smart phone. The goal of each trail is to provide the participant the historical context to the area surrounding the park coupled with the goal of have the participants exercise. While working on this project I have been responsible for user testing and feedback, scheduling, and assisting with design.

Grace Plains – *Project Manager*   **2014**
This project mixed theater and live action role playing. Participants were brought to Google's YouTube Space LA and were given a pair of Google Glass. Through Glass, each participant received a character to play, information about their character and other characters, and a script. Actors embedded in the experience would push the story forward through the persona of their given character. I provided project management and technical assistance for this project during the development, testing, and implementation of the project.

Professional Experience

A Center for Research & Innovation in Elementary Education (CONNECT) & The Center for Research in Engineering, Media and Performance (REMAP)   2015 - Present
Graduate Student Researcher
▪ Leading the OpenPTrack project which uses computer vision for person tracking. This includes testing hardware, developing specifications, researching hardware, testing software, and managing the software development team
▪ Developing interactive, mixed reality learning interventions for use in math and science for first and second grade students
▪ Collecting qualitative data including pre and post-test interview data and assessments with first and second grade students to evaluate the learning interventions
▪ Leading the development of the OpenPTrack system permanent installations in the school of Theater, Film, and Television and UCLA's Lab School

The Center for Research in Engineering, Media and Performance (REMAP), UCLA   2013 - 2015
Project Manager
▪ Managed staff and students in a multi-disciplinary research lab with the purpose of enriching the arts, education, and performance through emerging technology research and storytelling
▪ Collaborated with academic departments, such as architecture and computer science, and corporate computer research and entertainment companies to develop, create, and implement a diverse range of multi-media and sensing technology interventions
▪ Engaged in all aspects of research, design, and testing of different novel and custom technology solutions for use in education, performance, and civic computing
▪ Effectively managed projects and evaluation of technology functionality to ensure progress aligned with roadmap and technical specifications
▪ Supported students in finding technical solutions to their project goals and classwork

Dynatech Security – Simi Valley   2011 – 2013
Project Manager & Lead Programmer
▪ Responsible for the successful installation, programming, and implementation of customized, full

home automation systems
- Ensured proper infrastructure design during the initial stages of home construction to support the automation system to be installed
- Programmed and integrated security & surveillance systems, climate controls, lighting controls, pool & spa controls, home theaters, and full home multi-media systems
- Developed custom interfaces allowing users to access the home automation system from an iPhone, iPad, remote controls, or in-wall touch screens

Boeing Defense Systems – Ridley Park, Pennsylvania   2009 - 2011
Project Manager & Data Technician
- Managed a multi-million dollar US Army logistics program for implementation on the Chinook helicopter
- Negotiated directly with the Department of Defense pertaining to program requirements, contractual obligations, and delivery schedule; incorporating changes into project control systems
- Transferred the flow down of program requirements to engineering teams and suppliers
- Coordination of program requirements across multiple teams to ensure proper integration of requirements and achievement of delivery deadlines

Matrix Art Collective – Guttenberg, New Jersey   2008 – 2009
Fabrication Specialist
- Programmed and tested the CNC mill and rapid prototype code for the creation of museum quality sculptures and specialty architectural installations
- Operated the Tecno CNC 5996 Premier Class CNC Mill and the DTM Sinterstation 2000 SLS Rapid Prototype Station, including loading and validating code before execution
- Operated a Minolta 3D scanner to develop digital 3D models
- Maintained the CNC mill and rapid prototype machine to keep both within predetermined tolerances
- Collaborated with teams to develop work flows and processes for creating final products