

HARRISON JESSE SMITH

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San Mateo, CA

Graphics and HCI researcher focused on applying deep learning to generate useful virtual-human behavior. Proven record of developing new algorithms/techniques, designing and running validation experiments, analyzing results, and clearly communicating impacts through presentations and publications. Seeking opportunities to apply these skills towards the advancement of social virtual reality and other forms of avatar-mediated communication.

EDUCATION

University of California, Davis	Davis, CA
Ph.D. Candidate, Computer Science	2019
<i>Dissertation: Evaluating and Enhancing Embodied, Avatar-Mediated Interaction</i>	
M.S. Computer Science	2018
Tufts University	Somerville, MA
B.S. Environmental Engineering. <i>Cum Laude</i>	2009

INDUSTRY EXPERIENCE

Facebook AI Research	Spring 2020 - Present
<i>Postdoctoral Researcher. Supervisor: Jessica Hodgins Ph.D.</i>	<i>Pittsburgh, PA</i>
Perform ongoing research at the intersection of deep learning and animation, focused on automatic rigging and skinning of highly varied user-generated content.	
Snap, Inc.	Summer 2018
<i>Research Intern. Supervisor: Yingying Wang, Ph.D.</i>	<i>Venice, CA</i>
Designed and implemented algorithms relevant to Snap's Bitmoji intellectual property. Presented results as an oral paper at a top-tier computer animation conference and published in a technical journal. Company applied for a patent (pending) based on the research I conducted here.	
Oculus Research (Facebook Reality Labs)	Fall 2016 - Spring 2017
<i>Research Intern. Supervisors: Michael Neff, Ph.D., Carsten Stoll, Ph.D.</i>	<i>Sausalito, CA</i>
Designed and implemented large-scale multi-user embodied VR study using OptiTrack, Oculus Rifts, and Unity. Conducted analyses and created software to support offsite annotation teams. Presented results as an oral paper at a top-tier HCI conference.	
Army Research Lab - West and USC Institute for Creative Technologies	Summer 2016
<i>Visiting Research Assistant. Mentor: Philipp Djang, Ph.D.</i>	<i>Playa Vista, CA</i>
Designed a reinforcement learning-based finite gradient difference approach to discover optimal aiming policies for different types of targets. Implemented the design using Python and OpenAI Gym. Presented results directly to Army Research Lab's Survivability/Lethality Analysis Directorate.	

SELECT LANGUAGES AND TOOLS

Python, PyTorch, OpenGL, Unity, Autodesk Maya, Vicon Blade, C#, C/C++

SELECT PROJECTS

Multi-Character Story Distribution and Gesture on Children’s Engagement 2019
University of California, Davis

A study investigating best-practices for enhancing embodied character-based storytelling software. As the lead researcher, I was responsible for developing the storyteller with Unity (C#) and Amazon Polly Text-To-Speech, experimental design, and data collection and analysis. I managed a team of researchers who collected and annotated in-classroom data from K-2 students. Accepted as an oral paper in *12th International Conference on Interactive Digital Storytelling (ICIDS) 2019*.

Efficient Neural Networks for Real-time Motion Style Transfer 2018
Snap, Inc.

Developed a deep learning-based algorithm for human motion style transfer and control. The approach was orders of magnitude faster and smaller than existing methods. As the lead researcher, I was responsible for designing and implementing the system in Python and PyTorch. Accepted as an oral paper in *ACM SIGGRAPH / Eurographics Symposium on Computer Animation 2019*.

Communication Behavior in Embodied Virtual Reality 2016 - 2017
Oculus Research (Facebook Reality Labs)

Designed and conducted a large-scale user study investigating the influence of full-body, motion capture-driven avatars on remote communication behavior. I co-designed the experiment, created experimental stimuli in Unity, oversaw data collection using an OptiTrak motion capture system, created new annotation tools in JavaScript/React to support the annotation team, and designed/conducted data analysis in Python. Presented as an oral paper at *Proceedings of CHI / ACM Conference on Human Factors in Computing Systems, 2018*.

Understanding the Impact of Gesture Performance on Personality Perception 2015 - 2016
University of California, Davis

Designed and executed series of perceptual experiments characterizing perceptions of virtual agent personality as a function of procedural motion capture adjustments. I created new pipelines for automated stimuli generation with Python and AutoHotKey, collected data through custom JavaScript experiments on Amazon Mechanical Turk, and designed/conducted data analysis in Python. Presented as an oral paper at *SIGGRAPH 2017*.

REFEREED PAPERS

The Impact of Multi-Character Story Distribution and Gesture on Children’s Engagement
Harrison Jesse Smith, Brian K. Riley, Lena Reed, Vrindavan Harrison, Marilyn Walker, Michael Neff
Proceedings of International Conference on Interactive Digital Storytelling 2019. (*Nominated for Best Long Paper, top 10% of all submissions*)

Efficient Neural Networks for Real-time Motion Style Transfer Harrison Jesse Smith, Chen Cao, Michael Neff, Yingying Wang
Proc. ACM Comput. Graph. Interact. Tech. 2, 2, Article 13 (July 2019), 17 pages.

Communication Behavior in Embodied Virtual Reality Harrison Jesse Smith and Michael Neff
Proceedings of CHI / ACM Conference on Human Factors in Computing Systems, 2018. (*Honorable Mention Award, top 5% of all submissions*)

Understanding the Impact of Animated Gesture Performance on Personality Perceptions
Harrison Jesse Smith and Michael Neff
ACM Transactions on Graphics, Vol. 36, No. 4, Article 49, 2017.

INVITED TALKS / POSTERS

ARDIN International Conference on Interactive Digital Storytelling (ICIDS) 2019, Embodiment and Affect Session *The Impact of Multi-Character Story Distribution and Gesture on Children's Engagement* November 20th, 2019 (Conference Presentation)

ACM SIGGRAPH / Eurographics Symposium on Computer Animation (SCA) 2019, Learning & (Mostly) Faces Session. *Efficient Neural Networks for Real-time Motion Style Transfer* July 26, 2019 (Conference Presentation)

ARCS Scholar Symposium, *The Value of Embodiment in Virtual Reality*. April 29, 2019 (Poster Presentation)

University of California, Berkeley, Institute of Design. *Communication Behavior in Embodied Virtual Reality* November 28, 2018 (Invited Presentation)

University of California, Davis, Technocultural Studies. *Communication Behavior in Embodied Virtual Reality* January 24, 2018 (Invited Presentation)

CHI 2018, Virtual Reality Session. *Communication Behavior in Embodied Virtual Reality* April 25, 2018 (Conference Presentation)

SIGGRAPH 2017, People Power Session. *Understanding the Impact of Animated Gesture Performance on Personality Perceptions*. July 31, 2017 (Conference Presentation)

ARCS Scholar Symposium, *Understanding the Impact of Animated Gesture Performance on Personality Perceptions*. April 24, 2017 (Poster Presentation)

TEACHING EXPERIENCE

Associate Instructor Spring 2019
Character Animation (TCS 131) *University of California, Davis*
Created syllabus, materials, assignments, and grading rubrics for upper-division undergraduate course (6 classtime hours per week)
Introduced complex topics and software through lectures and studio practical assignments.

Associate Instructor Summer 2017
Intro/Advanced Digital Imaging *University of California, Davis*
Created syllabus, materials, assignments, and grading rubrics for twenty hours of in-class workshops.
Introduced students to basics of photo editing workflows and best practices in Adobe Photoshop.

Teaching Assistant Spring 2016, Spring 2018
Character Animation (TCS 131) *University of California, Davis*
Helped students to create animations in Autodesk Maya. Graded and critiqued assignments.

Associate Instructor Summer 2016, Summer 2017
Intro/Advanced Web Design *University of California, Davis*
Created syllabus, materials, assignments, and grading rubrics for twenty hours of in-class workshops.
Introduced students to HTML, CSS, and JavaScript through examples and hands-on exercises.

Teaching Assistant Spring 2014, Spring 2015
Introduction to Web Development *University of California, Davis*
Co-developed syllabus for the course during the first and second times it was offered to students.
Prepared discussion section lecture materials, held office hours, graded assignments.

SERVICE

Professional

- Eurographics 2021, *Paper Reviewer*
- International Conference on Advances in Computer-Human Interactions 2020, *Program Committee*
- Transactions on Graphics 2019, *Paper Reviewer*
- Transactions on Affective Computing 2019, *Paper Reviewer*
- Transactions on Affective Computing 2018, *Paper Reviewer*
- Conference on Computer Animation and Social Agents (CASA) 2016, *Paper Reviewer*

Academic

- Computer Science Graduate Student Association Representative - Department of Computer Science, 2013-2018

HONORS AND AWARDS

Achievement Rewards for College Scientists (ARCS) Fellowship Recipient 2016-2019
University of California, Davis

ARCS Foundation provides scholarships to outstanding students in science, medicine, and engineering. 14 fellowships awarded annually amongst the 4,500 UC Davis graduates students in all departments.

Researcher Of The Year (Runner Up), Graduate Group in Computer Science 2018
University of California, Davis

Departmental award recognizing research contributions of current graduate students.

Leaders For The Future, Cohort 3 2018
University of California, Davis

A selective program for doctoral candidates providing development in leadership skills, business communication, project management, innovation, and intrapreneurship.

Graduate Group in Computer Science Travel Awards 2017-2020
University of California, Davis

Interdepartmental awards to facilitate travel and presentation at conferences.

PROFESSIONAL REFERENCES

Michael Neff, Ph.D. (530) 754-9510
Professor, University of California, Davis mpneff@ucdavis.edu
Ph.D. thesis advisor.

Yingying Wang, Ph.D.
Research Engineer, Snap, Inc. ywang@snap.com
Supervising manager during summer 2018 research internship at Snap, Inc.

Philipp Djang, Ph.D. (574) 312-2204
Directorate (Retired), U.S. Army Research Laboratory Philipp.djang@gmail.com
Supervising manager during summer 2017 research internship at Army Research Laboratory - West.