

Katherine J. Mimnaugh

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CURRENT POSITION

University of Oulu, Finland

Jan 2019 - Present

Doctoral Student, Computer Science and Engineering

Researcher in the Perception Engineering Group in the Center for Ubiquitous Computing

Advisor: Steven M. LaValle

EDUCATION

University of Illinois at Urbana-Champaign

May 2018

Master of Science, Natural Resources and Environmental Sciences

Thesis: Investigating How Mindfulness Promotes the Restorative Effects of Natural Environments in Virtual Reality

Advisors: Matthew Browning and Carena van Riper

University of Illinois at Urbana-Champaign

Aug 2008

Bachelor of Science, Psychology; second major in Spanish

Study Abroad: Granada, Spain

Fall 2007

PREVIOUS EXPERIENCE

Researcher

Sept 2018 – Dec 2018

Department of Cognitive Science & Artificial Intelligence, Prof. Max Louwerse, Tilburg University, Netherlands

- Worked on an artificial intelligence virtual human for medical training applications as part of Project VIBE
- Researched facial expressions for the avatar to avoid uncanny valley and created GDPR-compliant protocols

Fellowship

Jun 2018 – Dec 2018

Oculus Launch Pad Program, Facebook Technologies LLC

- Accepted into competitive program to support diverse developers of virtual reality content
- Attended two-day boot camp in Menlo Park for networking and VR developer training
- Collaborated on two virtual reality projects (360 film and social VR experience) for the program
- Attended virtual trainings and completed weekly blog posts on product development progress

Fellowship

May 2018 – July 2018

iVenture Student Startup Accelerator, University of Illinois at Urbana-Champaign

- Head of Production for YouMatter Studios, a student startup creating VR empathy films
- Conducted customer discovery surveys and learned about small business ecosystems
- Interviewed potential clients and businesses to explore product-market fit

Graduate Teaching Assistant

Jan 2018 – May 2018

CS 498 – Virtual Reality Course, Department of Computer Science, Prof. Lawrence Angrave, University of Illinois

- Created VR empathy film for class project on homelessness; supervised class project on VR relaxation app
- Trained 200 students in virtual reality development class and assisted with homework in Unity 3D
- Coordinated 4 projects filming 360-degree virtual reality videos and assisted with cinematography
- Oversaw coordination of class project sponsorship with 5 university faculty and staff collaborators

Research Program Coordinator and Graduate Research Assistant

Dec 2012 – May 2018

Cognition and Brain Lab, Prof. Kara Federmeier, University of Illinois at Urbana-Champaign

- Ran over 100 experiment sessions and trained 15 new lab members on brain signal recording techniques
- Conducted over 50 neuropsychological testing sessions with adults of all ages to assess cognitive function
- Recruited and trained 10 undergrad lab assistants; coordinated work for assistants with graduate students
- Collected data for reports, ordered lab equipment and wrote official documents for grants and the ERB

Graduate Research Assistant

Aug 2016 – Jul 2017

Virtual Reality & Nature Lab, Prof. Matthew Browning, University of Illinois at Urbana-Champaign

- Designed and carried out investigation on the stress buffering effects of nature exposure in virtual reality
- Developed and piloted experimental procedure; recruited, scheduled and ran 43 research sessions
- Wrote and secured Ethical Review Board approval and grant funding for the project
- Selected, tested and deployed psychophysiological, virtual reality, audio and video equipment

Laboratory Manager and Research Program Coordinator

Jun 2008 – Dec 2012

Cognitive & Affective Neuroscience of Psychopathology Lab, Profs. Wendy Heller & Greg A. Miller, Univ of Illinois

- Recruited over 2,500 study participants and scheduled multiple sessions for each subject
- Conducted an average of 10 lab tours, EEG and MRI experiments per week; ran 155 selected subjects
- Trained 17 students on experimental procedures and 5 students on EEG data processing
- Organized 102 GB worth of research data in databases with careful maintenance of confidential records

RESEARCH FUNDING AND GRANTS

- 2016-2017. Browning, M., & LaValle, S. M. *The technology of healing: Exploring simulated natural environments in virtual reality for therapeutic applications*. The Center on Health, Aging, and Disability Pilot Grant. \$20,000 – Assisted in writing and securing grant funding for my thesis research project
- Additional experience: Grant data compilation and writing assistance for: Cognitive & Affective Neuroscience of Psychopathology Lab (principal investigators: Wendy Heller and Greg Miller), Cognition and Brain Laboratory (principal investigator: Kara Federmeier) and the Virtual Reality & Nature Laboratory (principal investigator: Matthew Browning)

TEACHING AND PEDAGOGY

Invited Lectures and Short Courses

- “*Opportunities to Support Mental Health with Virtual Reality Nature Videos*” – 10th Jun 2020, Invited speaker for Women Tech Global Conference 2020. Conference held online due to COVID-19
- “*Augmented & Virtual Reality: Beyond Gaming*” – 8th Mar 2020, Invited panel for WECode 2020, Harvard University, Cambridge, USA (conference held online due to COVID-19)
- “*El Cerebro y la Mente: An Introduction to Cognitive Neuroscience for HCI*” – 2nd Oct 2019, Invited lecture at the Centro de Investigación en Matemáticas, Guanajuato, Mexico
- “*Human Perception I: Physiology*” and “*Human Perception II: Cognition and Experience*” – 28th Aug 2019, Short course for the Joensuu Summer School on Optics, University of Eastern Finland, Joensuu, Finland
- “*Vestibular System, Neurophysiology of VR Sickness and Human Subjects Research*” – 23rd Apr 2019, Guest lecture for the VR Systems and Humans course, University of Oulu, Oulu, Finland
- “*Virtual Reality for Medical Applications*” – 14th Nov 2018, Guest lecture for the Virtual and Augmented Reality course, Tilburg University, Tilburg, Netherlands
- “*Human Vestibular System, Vection, and Preventing VR Sickness*” – 23rd Apr 2018, Guest lecture for the Virtual Reality course, University of Illinois, Champaign, USA
- “*VR for Good: Virtual Reality for Beneficial Societal Applications*” – 4th Dec 2017, Guest lecture for the Virtual Reality course, University of Illinois, Champaign, USA

Teaching Experience

- Teaching Assistant, Computer Science course in Virtual Reality, University of Illinois – Jan 2018
- Co-supervision of bachelor’s thesis, “Scale Perception in Virtual Reality,” University of Oulu – April 2019
- Co-supervision of bachelor’s project, “Distinguishing Vertigo from VR Sickness,” University of Oulu – June 2020
- Co-supervision of bachelor’s project, “Perceptual Training,” University of Oulu – June 2020
- Co-supervision of bachelor’s thesis, “Effectiveness of a Wii Balance Board as a Locomotion Control Method for a Virtual Reality Telepresence Robot,” University of Oulu – July 2020
- Co-supervision of master’s thesis, “Exploring the Potential of VR Games as Exercise,” University of Oulu – July 2020

Training on Research Methods, Data Analysis, and Responsible Laboratory Conduct

- 22 undergraduate and graduate assistants for the Cognitive & Affective Neuroscience of Psychopathology Lab
- 15 undergraduate, graduate, and postdoc assistants for the Cognition and Brain Laboratory
- 4 undergraduate assistants for the Virtual Reality & Nature Laboratory

HONORS AND AWARDS

- **Google Europe Students with Disabilities Scholarship** (May 2020) - Awarded to students with disabilities in computer science that demonstrate academic merit, leadership and a passion for computer science
- **Gamma Sigma Delta Honor Society** (Mar 2017) - Awarded to graduate students who demonstrate outstanding ability, great potential for future leadership, and those with at least a 3.5/A=4.0 or better grade point average
- **Campaign Award** (Aug 2014) - Awarded by the Sierra Student Coalition for the creation and operation of a youth international campaign to the United Nations Conference of the Parties

- **Bridge-Building Award** (Aug 2012) - Awarded by the Sierra Student Coalition for collaborative work with the Champaign-Urbana community around campus fossil fuel divestment and other local environmental initiatives

MEMBERSHIPS AND SERVICE

Institute of Electrical and Electronics Engineers, Student Member Jan 2019 – Present
 Association for Computing Machinery, Student Member Jan 2019 – Present
 International Association for Society and Natural Resources, Student Member Jan 2016 – Dec 2017

Founder, UIUC VR for Good Club Jan 2018 – May 2018

- Created organization focused on developing virtual reality for educational, scientific and socially beneficial uses
- Organized biweekly meetings to discuss relevant topics, opportunities for projects and potential collaborations

International Committee, Sierra Student Coalition Jan 2014 – Jan 2016

- Co-chair of International Committee (2014) - created and lead campaign to international climate negotiations

Campaigns and Trainings, Sierra Student Coalition Aug 2012 – Jan 2014

- Co-lead of Campaigns Committee - provided support for student environmental campaigns nationwide in USA

Prairie Rivers Network, Sierra Club & Heartland Coalfield Alliance Oct 2011 – Dec 2014

- As Student Liaison for the Sierra Club group, spearheaded collaboration between local activists and students

UIUC Beyond Coal Campaign, Students for Environmental Concerns Sept 2011 – Jan 2014

- Alumni Engagement Chair (Fall 2013), Outreach Chair (Fall 2012, Spring 2013), Coalition-Building Chair (Spring 2012), Phonebank and Databasing Leader (Fall 2011)

JOURNAL PUBLICATIONS

- Becerra, I., Suomalainen, M., Lozano, E., **Mimnaugh, K. J.**, Murrieta-Cid, R., & LaValle, S. (2020). Human perception-optimized planning for comfortable VR-based telepresence. *2020 Robotics and Automation Letters (RA-L)*.
- Letkiewicz, A. M., Siltan, R. L., **Mimnaugh, K. J.**, Miller, G.A., Heller, W., & Sass, S. (2020). Childhood abuse history and attention bias in adults. *Psychophysiology*, 1-21.
- Browning, M., **Mimnaugh, K. J.**, van Riper, C., Laurent, H., & LaValle, S. (2020). Can simulated nature support mental health? Comparing short, single-doses of 360-degree nature videos in virtual reality with the outdoors. *Frontiers in Psychology*, 10, 2667.
- Ryskin, R., Ng, S., **Mimnaugh, K. J.**, Brown-Schmidt, S., & Federmeier, K. (2018). Talker-specific predictions during language processing. *Language, Cognition and Neuroscience*, 1-16.
- Sass, S.M., Heller, W., Fisher, J.E., Siltan, R.L., Stewart, J.L., Crocker, L.D., **Mimnaugh, K. J.**, & Miller, G.A. (2014). Electrophysiological evidence of the time course of attentional bias in non-patients reporting symptoms of depression with and without co-occurring anxiety. *Frontiers in Psychology*, 5, 301.
- Letkiewicz, A. M., Miller, G. A., Crocker, L. D., Warren, S. L., Infantolino, Z. P., **Mimnaugh, K. J.**, & Heller, W. (2014). Executive function deficits in daily life prospectively predict increases in depressive symptoms. *Cognitive Therapy and Research*, 38(6), 612-620.

CONFERENCE PUBLICATIONS

- Becerra, I., Suomalainen, M., Lozano, E., **Mimnaugh, K. J.**, Murrieta-Cid, R., & LaValle, S. (2020, October). *Human perception-optimized planning for comfortable VR-based telepresence*. Paper to be presented at the 2020 IEEE/RSJ International Conference on Intelligent Robots and Systems, Las Vegas, NV.
- Pouke, M., **Mimnaugh, K. J.**, Ojala, T., & LaValle, S. (2020, March). *The plausibility paradox for scaled-down users in virtual environments*. Conference presentation at IEEE VR 2020 - 27th IEEE Conference on Virtual Reality and 3D User Interfaces, Atlanta, GA (conference held online due to COVID-19).
- **Mimnaugh, K. J.**, van Riper, C. & Browning, M. (2018, June). *Mindfulness as a mechanism for restoration from nature: A study of the effects of natural environments and virtual reality on psychological responses to stress*. Poster presentation at the International Symposium on Society and Resource Management, Salt Lake City, UT.
- Browning, M., & **Mimnaugh, K. J.** (2017, June). *Can virtual reality be used to mimic the health benefits of nature and systematically test environmental psychology theory?* Poster presented at Environmental Design Research Association conference, Madison, WI.
- **Mimnaugh, K. J.** & Browning, M. (2017, April). *Do we need 'actual' park visitation for Park Rx? Studying*

nature-based virtual reality for stress-reduction. Poster presentation at George Wright Society conference, Virginia Beach, VA.

- Taff, D., Van Riper, C., Browning, M., **Mimnaugh, K. J.**, Thomsen, J., Newman, P., Hipp, A., Brownlee, M., Koontz, L., and Richardson, L. (2017, April). *Health parks healthy people: State of the evidence and paths to improve the science*. Panel presentation at George Wright Society conference, Virginia Beach, VA.
- Ryskin, R., Ng, S., **Mimnaugh, K. J.**, Brown-Schmidt, S., & Federmeier, K. D. (2017, March). *Speaker-specific predictions about membership during language comprehension*. Poster presented at the annual meeting of the Cognitive Neuroscience Society, San Francisco, CA.
- Browning, M., & **Mimnaugh, K. J.** (2017, March). *Preliminary results from simulating nature, enhancing health project: An exploration of the therapeutic applications of natural environments in virtual reality*. Poster presented at Chittenden Symposium on Assistive Technologies in Health, Champaign, IL
- Browning, M. & **Mimnaugh, K. J.** (2016, October). *Technology of healing: Exploring simulated natural environments for therapeutic applications*. Poster presented at the North American Association for Environmental Education Conference, Madison, WI.
- **Mimnaugh, K. J.** & Browning, M. (2016, June). *The technology of healing: Exploring simulated natural environments in virtual reality for therapeutic applications*. Poster presented at the International Symposium on Society and Resource Management, Houghton, MI.
- Browning, M & **Mimnaugh, K. J.** (2016, April). *Simulating nature, enhancing health: Exploring therapeutic applications of natural environments in virtual reality, and opportunities for the Design Center*. Poster presented at the Chittenden Symposium, Champaign, IL.
- Browning, M., Browning, L., Chalip, L., van Riper, C., Stewart, W., & **Mimnaugh, K. J.** (2016, April). *Simulating nature, enhancing health: Virtual reality proposal for the Design Center*. Poster presented at the University of Illinois Design Center Lightning Symposium, Champaign, IL.
- Letkiewicz, A. M., Siltan, R. L., **Mimnaugh, K. J.**, Heller, W., Miller, G. A., & Sass, S. M. (2015, September). *Child abuse and altered processing of negative stimuli in adulthood*. Poster presented at the annual meeting of the Society for Psychophysiological Research, Seattle, WA.
- Finy, M. S., Hojnicky, M. P., Crocker, L. D., Warren, S. L., O'Hare, A. J., **Mimnaugh, K. J.**, Smolen, A., Miller, G. A., & Heller, W. (2014, March). *Anxious arousal as a joint function of inhibitory dysfunction and the dopamine D4 receptor gene (DRD4) polymorphism*. Poster presented at the International Workshop on Statistical Genetic Methods for Human Complex Traits, Boulder, CO.
- Finy, M. S., Hojnicky, M. P., Crocker, L. D., Warren, S. L., O'Hare, A. J., **Mimnaugh, K. J.**, Miller, G. A., & Heller, W. (2013, September). *Anxious arousal as a joint function of inhibitory dysfunction and the dopamine D4 receptor gene (DRD4) polymorphism*. Poster presented at the annual meeting of the Society for Research in Psychopathology, Oakland, CA.
- Letkiewicz, A. M., Heller, W., Crocker, L. D., **Mimnaugh, K. J.**, Warren, S. L., Spielberg, J. M., & Miller, G. A. (2013, September). *Rumination mediates a relationship between executive dysfunction and increases in depressive symptoms over time*. Poster presented at the annual meeting of the Society for Research in Psychopathology, Oakland, CA.
- Tengshe, C., Heller, W., Hur, J., O'Hare, A. J., Crocker, L. D., Warren, S. L., Spielberg, J. M., **Mimnaugh, K. J.**, Bredemeier, K., & Miller, G. A. (2013, September). *Relationships among anxiety types, rumination and depression*. Poster submitted for presentation at the 27th annual meeting of the Society for Research in Psychopathology, Oakland, CA.
- Murdock, C. D., Crocker, L. D., Warren, S. L., **Mimnaugh, K. J.**, Miller, G. A., & Heller, W. (2013, May). *Executive function deficit in unipolar depression: The important role of emotional control*. Poster presented at the 25th Annual Convention of the Association for Psychological Science, Washington, D.C.

SUBMISSIONS UNDER REVIEW AND BOOK CONTRIBUTIONS

- Pangilinan, E., Lukas, S., & Mohan, V. (2019). *Creating Augmented and Virtual Realities: Theory and Practice for Next-Generation Spatial Computing*. O'Reilly Media, Inc. (technical editor).