

Thao Phung

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EDUCATION

Colorado School of Mines, Golden, CO

Jan 2020 - Now

M.S. and Ph.D. in Computer Science

Research Interest: Human Robot Interaction (HRI), Augmented Reality (AR), Machine Learning

Advisor: Tom Williams

University of Wyoming, Laramie, WY

Aug 2013 - Dec 2018

B.S. in Computer Science

Online Degrees, Udacity

Bertelsmann Data Science Challenge

May 2018 - Aug 2018

Front-End Web Developer Nanodegree

Apr 2018 - Oct 2018

Intro to Self-Driving Cars Nanodegree

Oct 2017 - Jan 2018

Deep Learning Foundation Nanodegree

Feb - Sept 2017

Machine Learning Nanodegree

Aug 2016 - Jul 2017

PUBLICATIONS

1. Jared Halmilton*, Thao Phung*, Nhan Tran, Tom Williams. "What's The Point? Tradeoffs Between Effectiveness and Social Perception When Using Mixed Reality to Enhance Gesturally Limited Robots". In: *HRI* (2021)
2. Nhan Tran, Kai Mizuno, Trevor Grant, Thao Phung, Leanne Hirshfield, Tom Williams. "Exploring Mixed Reality Robot Communication Under Different Types of Mental Workload". In: *VAM-HRI* (2020)
3. Adam Stogsdill, Thao Phung, Tom Williams. "Investigating Confidence-Based Category Transition of Spatial Gestures". In: *HRI-NLRG* (2020)
4. Thao Phung, Anh Nguyen, Jeff Clune. "Learning to Solve Symbolic Math from Visual Inputs". In: *WiM-NIPS* (2018)
5. Thao Phung, Amy Banic. "Investigation on the Use of Perception Manipulation to Enhance Virtual Reality Training". In: *RMWCWIC* (2016)

RESEARCH AND PROJECTS

A survey on Virtual, Mixed, Augmented Reality in Human-Robot Interaction

Feb 2020 - Now

- Surveyed more than 400 papers on virtual, mixed, augmented reality HRI topics.

- Designed a new framework/classifier for different VAM techniques used in HRI.

What's The Point? Tradeoffs Between Effectiveness and Social Perception When Using Mixed Reality to Enhance Gesturally Limited Robots

Jan 2020 - Oct 2020

Accepted to Human-Robot Interaction conference (HRI 2021)

- Investigated different mixed reality gestures for armless robots to improve human-robot communication.

American sign language (ASL) recognition using deep neural networks

May 2018

Oral presented at Wyoming Undergraduate Research Day

- Hand-designed a training set of over 2860 videos for ASL alphabet including motion letters.

- Trained convolutional neural networks (CNNs) and recurrent neural networks (RNNs) using Python to recognize ASL hand gestures performed by different people in different lighting conditions.

- On a small, hand-generated training set, obtained 9.7% accuracy on test set, improving over the 3% accuracy obtained by random guessing.

Learning to solve symbolic math from visual inputs

May 2017

Poster presented at CVPR 2017 and NIPS 2017 workshops

- Trained CNNs to do addition and subtraction given visual inputs of handwritten equations.
- Obtained 98% test set accuracy on new handwriting styles of previously seen equations and 15% accuracy on entirely new equations.

Investigation on the use of perception manipulation to enhance virtual reality training

Oct 2016

Poster presented at Rocky Mountain Celebration of Women in Computing (RMCWiC) 2016

- Researched action-specific perception: how a person's perception of the environment changes in conjunction with his/her ability to act in it.
- Designed Oculus-driven golf putting simulation in Unity.

WORK EXPERIENCE

Research Assistant

Jan 2020 - Now

MirrorLab, Colorado School of Mines

- Collaborated with a diverse group of robot and cognitive science labs on several research projects.

Library Technical Assistant

Oct 2016 - July 2019

Coe Library, University of Wyoming

- Learned how to professionally handle and prepare fragile fossil specimens for 3D digitization using HP 3D Scan with structured light scanning technology and Clearform's Portable 3D Scanner.
- Processed more than 450 digital objects in different formats to be delivered via web; assisted with deployment and visualization of 3D objects on mobile devices.
- Developed a user-friendly, interactive web presentations of high-resolution 3D models.

Research Assistant

Evolving AI Lab, University of Wyoming

Dec 2016 - Dec 2018

3DiA Lab, University of Wyoming

Apr 2015 - Dec 2016

- Collaborated with a diverse group of graduate students on several research projects, resulting in two presentations at major conferences.
- Presented research papers and offered advice on other research projects during weekly lab meeting.

TECHNICAL SKILLS

- Extensive experience developing machine learning applications in Python using sikit-learn and Keras libraries.
- Fluent in developing solutions to classification problems via regression, clustering, and deep learning in Python.
- Familiar with using Caffe and Tensorflow frameworks to perform research in artificial intelligence.
- Comfortable operating Linux, Mac OS X, and Windows operating systems.
- **Languages and Software:** Python, C++, Java, C#, HTML, CSS, Microsoft Office, Adobe Photoshop
- **Statistical Methods:** regression models, dimensionality reduction, Bayesian statistics

COURSE WORKS

- Computer Vision
- Machine Learning
- Artificial Intelligence
- Data Mining
- Linear Algebra

GRANTS AND FELLOWSHIPS

- Women in Machine Learning at NIPs travel award: \$300 Dec 2017
- Women in Computer Vision at CVPR travel award: \$900 Jul 2017
- Wyoming Research Scholar Program grant: \$500 Jul 2017
- EPSCoR Research Fellowship: \$1,600 Oct 2015 - May 2016

AWARDS AND SCHOLARSHIPS

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|---|----------------------------|
| - Bertelsmann Data Science Challenge Scholarship | <i>May 2018 - Aug 2018</i> |
| - Grow with Google Front-End Web Developer Nanodegree Scholarship | <i>Apr 2018 - Oct 2018</i> |
| - Grow with Google Challenge Scholarship: Front-End Web Dev | <i>Jan 2018 - Apr 2018</i> |
| - Lyft Intro to Self-Driving Cars Scholarship: \$800 | <i>Oct 2017 - Jan 2018</i> |
| - 3rd Best Poster Presentation at RMCWiC | <i>Sept 2016</i> |
| - International Student Scholarship: \$1,000 | <i>Aug 2014 - May 2015</i> |
| - Rocky Mountain Scholars Award: \$22,000 | <i>Aug 2013 - May 2017</i> |

PRESENTATIONS

Poster Presentations

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|---|---------------------------|
| - Women in Machine Learning (WiML) in conjunction with NIPs | <i>Dec 2017</i> |
| Learning to solve symbolic math from visual inputs | <i>Long Beach, CA</i> |
| - Women in Computer Vision (WiCV) in conjunction with CVPR | <i>Jul 2017</i> |
| Learning to solve symbolic math from visual inputs | <i>Honolulu, HI</i> |
| - Rocky Mountain Celebration of Women in Computing (RMCWiC) | <i>Sept 2016</i> |
| Investigation on the use of perception manipulation to enhance virtual reality training | <i>Salt Lake City, UT</i> |

Oral Presentation

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|---|--------------------|
| - Research Day, University of Wyoming | <i>Apr 2018</i> |
| American Sign Language Recognition with Microsoft HoloLens | <i>Laramie, WY</i> |
| - Research Day, University of Wyoming | <i>May 2016</i> |
| Investigation on the use of perception manipulation to enhance virtual reality training | <i>Laramie, WY</i> |

SERVICES AND ACTIVITIES

Reviewing

- Workshop papers: WiML2017

LANGUAGES

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| Vietnamese | Native speaker |
| English | Proficient |