

Ewa Magdalena Nowara

Houston, Texas, 77005

enowara1@jhu.edu

<https://ewanowara.github.io/> [LinkedIn](#)

EDUCATION

Ph.D. in Electrical and Computer Engineering Rice University <i>Thesis: Imaging Photoplethysmography in Unconstrained Settings</i>	August 2015 – May 2021 Houston, TX
Master of Science in Electrical and Computer Engineering Rice University	August 2015 - May 2018 Houston, TX
Bachelor of Science in Physics St. Mary's University GPA: 4.0/4.0 (summa cum laude, Presidential Award Recipient)	August 2011 - May 2015 San Antonio, TX

SELECTED RECENT PUBLICATIONS (Full list on [Google Scholar](#))

1. **Nowara, E. M.**, McDuff, D., Veeraraghavan, A. "The Benefit of 'Distraction': Denoising Video-Based Physiological Measurements using Inverse Attention" *ICCV*, 2021
2. **Nowara, E. M.**, McDuff, D., Veeraraghavan, A. "Combining Magnification and Measurement for Non-Contact Cardiac Monitoring" *CVPR Workshops*, 2021
3. **Nowara, E. M.**, McDuff, D., "'Warm Bodies': A Post-Processing Technique for Animating Dynamic Blood Flow on Photos and Avatars" *ACM CHI Conference on Human Factors in Computing Systems*, 2021
4. **Nowara, E. M.**, McDuff, D., Veeraraghavan, A. "A Systematic Analysis of Video-based Pulse Measurement from Compressed Videos" *Biomedical Optics Express*, 12.1 494-508, 2021
5. **Nowara, E. M.**, Marks, T. K., Mansour, H., Veeraraghavan, A. "Near-Infrared Imaging Photoplethysmography During Driving" *IEEE Transactions on Intelligent Transportation Systems*, 2020
6. **Nowara, E. M.**, McDuff, D., Veeraraghavan, A. "A Meta-Analysis of the Impact of Skin Type and Gender on Non-contact Photoplethysmography Measurements" *CVPR Workshops*, 2020
7. **Nowara, E. M.**, Sabharwal, A., Veeraraghavan, A. "PPGSecure: Biometrics Presentation Attack Detection Using Photoplethysmograms." *Automatic Face and Gesture Recognition (FG)*, 2017

PATENTS

Marks T., Mansour H., **Nowara E.**, Nakamura Y., Veeraraghavan A., inventors; Mitsubishi Electric Corp, Mitsubishi Electric Research Laboratories Inc, assignee. "System and method for remote measurements of vital signs." *United States patent application 16/167,668* 2019

RESEARCH AND WORK EXPERIENCE

Johns Hopkins University <i>Postdoctoral Research Fellow in Electrical and Computer Engineering</i> <i>Mentor: Prof. Rama Chellappa</i>	May 2021 – Present Baltimore, MD
<ul style="list-style-type: none">• Developed computer vision and machine learning algorithms to geo-localize natural images.• Designed interpretable deep learning algorithms and solutions to lower the dimensionality of the data space to improve training models with limited data.• Used semantic segmentation, object detection, classification, and image retrieval	

Los Alamos National Laboratory
Research Intern (Theoretical Division, T-5)

October 2020 - February 2021
Remote

Mentor: Brendt Wohlberg

- Developed self-supervised learning algorithms (contrastive learning and cycle-consistency) with autoencoder and Long-Short-Term Memory (LSTM) architectures to reconstruct high resolution images obtained from ptychographic measurements without ground truth

Microsoft Research

June 2019 - June 2020

Research Intern (Human Understanding and Empathy Team)

Redmond, WA

Mentors: Daniel McDuff, Mary Czerwinski

- Developed a convolutional attention neural network for denoising time signals from video
- Worked on self-supervised machine learning for regression with limited and noisy labels
- Created realistic 3D avatars using computer graphics and physiological signals from video
- Recovered subtle physiological intensity variations from compressed videos using supervised deep learning for regression

Mitsubishi Electric Research Laboratories

May 2017 - June 2019

Research Intern (Computer Vision Team)

Cambridge, MA

Mentors: Tim Marks, Hassan Mansour

- Developed optimization and denoising algorithms using robust principal components analysis (RPCA), Alternating Direction Method of Multipliers (ADMM), Fast Iterative Shrinkage-Thresholding Algorithm (FISTA)
- Built a driver monitoring system using RGB and NIR cameras, optical and 3D printed hardware, light source synchronized with camera frame capture, face detection, tracking
- Collected and released the first large public driving dataset with face videos and physiology

SELECTED AWARDS AND HONORS

- | | |
|--|-------------|
| • Invited speaker, Microsoft Research AI Breakthroughs | 2020 |
| • Best graduate poster and demo, ECE Corporate Affiliates Day at Rice University | 2019 |
| • Ken Kennedy Institute for Information Technology Schlumberger Fellowship | 2017 – 2018 |
| • Selected attendee, Doctoral Consortium at Automatic Face and Gesture Recognition | 2017 |
| • Selected attendee, CRA-W (Computing Research Association) Grad Cohort | 2016 |
| • Texas Instruments Fellowship | 2015 |
| • Presidential Award (given to top 14 graduating seniors) | 2015 |

TOOLS AND SKILLS

Programming: Python, Keras, TensorFlow, PyTorch, MATLAB, HTML/CSS, OpenCV, Docker, Arduino, Shell, Vim

Knowledgeable In: Machine Learning, Deep Learning, Computer Vision, Signal Processing, Optimization, Image Processing, Illustrator, 3D Printing, Soldering, Optics, Linux, Windows