Max Ruby

(formerly Raymond Maxwell Jeter)

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OBJECTIVE

Graduating Masters Student in Applied Mathematics. Two conference publications. Experience coding in Python and designing CNNs and GANs for Image Processing.

EDUCATION

Master of Science, Mathematics
Purdue University, West Lafayette, IN,   Expected May 2020

Bachelor of Science, Mathematics
Oklahoma State University, Stillwater, OK,   May 2014

Oklahoma State University - Oklahoma City, Oklahoma City, OK,   August 2008

TECHNICAL SKILLS

Languages: Python, C, C++, Matlab.
AI frameworks: PyTorch, Keras, Tensorflow.
Operating Systems: Linux, Windows.
Key Areas of Research: GANs, CNNs, Applied Mathematics, Image Processing.

EXPERIENCE

Purdue University, Lafayette, Indiana USA

Graduate Student/Teaching Assistant   August 2019 - present
                                                                              August 2014 - May 2019

- Developed code in Matlab and Python to contribute to research in Image Processing, including writing programs to generate synthetic images.
- Taught and graded for recitation sections for undergraduate level mathematics courses, including Calculus 1-3 and Differential Equations/Linear Algebra
- Graded homework and proctored examinations for undergraduate and graduate level mathematics courses, including Advanced Mathematics for Engineers.

Oak Ridge Institute for Science and Education, Oak Ridge, Tennessee USA

Advanced Short-Term Research Opportunity (ASTRO) Participant at
Oak Ridge National Laboratory (ORNL)   June - August, 2019

- Developed the Mertens-Unrolled Network (MU-Net), a novel CNN/GAN written in Python using Keras with the Tensorflow backend.
- Integrated the MU-Net into an imaging pipeline which was used for face recognition, which improved the AUROC by 8.9% over the prior method of HDR fusion used.
- Improved various Image Processing algorithms in the imaging pipeline, including fine registration.
- Organized the dataset used to train the MU-Net by utilizing the improved Image Processing algorithms.
- Set up an Imaging System with a diverse team, sharing code using Git.
- Published the MU-Net paper with the team, continuing collaboration after leaving.

CURRENT PROJECT

Development of a lightweight GAN for generating images with an end goal to produce artwork. Coding is done in Python. AI framework is Keras with the Tensorflow backend. Progress is pushed to Github.

PUBLICATIONS

Max Ruby, David S. Bolme, Joel Brogan, David Cornett III, Baldemar Delgado, Gavin Jager, Christi Johnson, Jose Martinez-Mendoza, Hector Santos-Villalobos, Nisha Srinivas, "The Mertens Unrolled Network (MU-Net): A High Dynamic Range Fusion Neural Network for Through the Windshield Driver Recognition," *Accepted to SPIE Autonomous Systems: Sensors, Processing and Security for Vehicles & Infrastructure*, 2020.

D. Hye Ye, G. T. Buzzard, M. Ruby, C. A. Bouman, "Deep Back Projection for Sparse-View CT Reconstruction," *GlobalSIP*, 2018.

AWARDS AND HONORS

Oklahoma State University: Departmental Honors in Mathematics (2014), Hazel Bucy Award (2013, 2014)
William Lowell Putnam Mathematical Competition: Score of 30 (2012)