Damian Owerko

Physics and Systems Engineering Student

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Languages

English: proficient
Polish: native
Spanish: communicative

Programming

Mastery in Python,
C++, Matlab
Competent in C#, Java,
OCaml, Mathematica,
Tensorflow, PyTorch

Interested in applying machine learning techniques to socially relevant problems such as optimization of energy grid. Extensive experience in applied graph signal processing and deep learning. Published one conference paper for GlobalSIP 2018 and submitted paper for ICASSP 2020.

Education

2016-2020 **Candidate for B.S.E in Systems Engineering, University of Pennsylvania**
Vagelos Integrated Program in Energy Research
GPA: 3.68 | Courseworks: discrete signal processing, statistics, stochastic systems, dynamic systems, networked systems

2016-2020 **Candidate for B.A. in Physics, University of Pennsylvania**
Vagelos Integrated Program in Energy Research
GPA: 3.68 | Courseworks: quantum mechanics, statistical mechanics, partial differencial equations, electromagnetism

Honors and Awards

2019 **E. Stuart Eichert, Jr. Memorial Prize, University of Pennsylvania**
Awarded to three juniors who, in the judgment of the School's faculty, best demonstrate initiative, intellectual attainment, and commitment to the professional practice of engineering.

Professional Experience

since 2016 **Research Asistant, University of Pennsylvania** Philadelphia, PA
Prof. Alejandro Ribeiro's Lab.

- Authored two conference papers on "Predicting Power Outages Using Graph Neural Networks" and "Optimal Power Flow Using Graph Neural Networks"
- Explored applications of graph neural networks such as energy grids and NLP
- Developed graph scattering convolutional networks - a precursor to graph neural networks

spring 2018 **Teaching Assistant, University of Pennsylvania** Philadelphia, PA
ESE224: Signal and Information Processing.

- Led laboratory classes where students learnt about signal processing in Matlab
- Covered topics such as discrete and continuous fourier transform, sampling, LTI systems, image processing, principal component analysis, and graph signal processing
- Hosted office hours and graded homework assignments

summer 2016 **Intern, Machine Learning Division, Codilime** Warsaw, Poland

- Applied image recognition techniques to classify malware using only binaries
- Independently produced state of the art results for a non-ensemble approach

summer 2015 **Lab Assistant, Institute of Electronic Materials Technology** Warsaw, Poland

- Optimized the graphene production process to maximize material properties
- Analyzed samples using Raman spectroscopy and the van der Pauw method to evaluate the effectiveness of each process stage

Extracurricular Activities

2016-2020 **Software Lead, Penn Electric Racing** University of Pennsylvania

- Built an electric formula race car that won Formula North and FSAE Lincoln
- First team in NA to successfully design a four wheel drive car
- In 2017 we were the 3rd best team in the world according to official rankings
- Designed PCB responsible for logging all data going through the car
- Implementing torque vectoring algorithm to enchance cornering performance

2016-2020 **President, Penn Aerial Robotics** University of Pennsylvania

- Manage a club of approximately 40 people competing at four competitions annualy
- Design fully autonomous software for custom built rotary aircraft
- Lead project teams that compete at prestigious competitions such as IARC, NFS CPSVO and AUVSI SUAS
- Received cash prize for obstacle avoidance using a artificial potential fields

2018 **Project Sightstone, PennApps Hackathon** Philadelphia, PA

- Recieved "Most likely to be a founder" award by Rough Draft Ventures
- Designed proof of concept refreshable braille display using smart materials
- In charge of the control circuit, drivers and API for display of brail and images on the device

Publications

Papers in peer-reviewed conferences

[1] Optimal Power Flow Using Graph Neural Networks
Damian Owerko, Fernando Gama, Alejandro Ribeiro
Submitted for 45th IEEE International Conference on Acoustics, Speech and Signal Processing, 2019.

[2] Predicting Power Outages Using Graph Neural Networks
Damian Owerko, Fernando Gama, Alejandro Ribeiro
2018 IEEE Global Conference on Signal and Information Processing (GlobalSIP), 2018.

Peer-review Activities

2019 Journal reviewer for *Journal of Ambient Intelligence and Humanized Computing*
Prediction of Electrical Power Disturbances Using Machine Learning Techniques

Other Projects

2019-2020 Senior Design: System of BLE beacons to track employees during fires

2018 Online bomberman game in Java
https://github.com/Damowerko/InvisiBomberman

2018 Wearable system that detects the direction of loud noises and provides haptic feedback
https://github.com/Damowerko/PennAppsXV

2016 A FPS game with ballistic bullets, richochets and destruction
https://github.com/Damowerko/ICFPS