

Armin Hadzic

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in armin-hadzic

Research Interests

Developing **deep learning** methods to address challenges in latent information representation from varying sources, such as point clouds, images, and audio. More generally, I am interested in **deep learning, computer vision, reinforcement learning, artificial intelligence, remote sensing, and robotics**.

Education

University of Kentucky

2018-2020

Master of Science in Computer Science, GPA – 4.0

Advisor: Nathan Jacobs

Thesis: Estimating Free-Flow Speed with LiDAR and Overhead Imagery

University of Kentucky

2016

Bachelor of Science in Computer Engineering, GPA – 3.8

Graduated Magna Cum Laude

University of Kentucky

2009-2013

Bachelor of Science in Electrical Engineering, GPA – 3.8

Graduated Magna Cum Laude, Minor in Computer Science

Computer Science Outstanding MS Student 2020.

Dean's List Fall 2010 to Spring 2013.

Publications

- [1] Mei Chen, Armin Hadzic, Weilian Song, and Nathan Jacobs. "Applications of Deep Machine Learning to Highway Safety and Usage Assessment". In: *Transportation Research Board Workshop (Sponsored by AED50)*. (oral). January 2021.
- [2] Ryan Mukherjee, Derek Rollend, Gordon Christie, Armin Hadzic, Sally Matson, Anshu Saksena, and Marisa Hughes. "Towards Indirect Top-Down Road Transport Emissions Estimation". In: *IEEE/ISPRS Workshop: Large Scale Computer Vision for Remote Sensing Imagery (EARTHVISION)*. **Best Paper Award**. Nashville, Tennessee, June 2021.
- [3] Armin Hadzic, Hunter Blanton, Weilian Song, Mei Chen, Scott Workman, and Nathan Jacobs. "RasterNet: Modeling Free-Flow Speed using LiDAR and Overhead Imagery". In: *IEEE/ISPRS Workshop: Large Scale Computer Vision for Remote Sensing Imagery (EARTHVISION)*. Seattle, Washington, June 2020.
- [4] Armin Hadzic, Gordon Christie, Jeffrey Freeman, Amber Dismar, Stevan Bullard, Ashley Greiner, Nathan Jacobs, and Ryan Mukherjee. "Estimation Displaced Populations from Overhead". In: *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*. Waikoloa Village, Hawaii, September 2020.
- [5] Weilian Song, Scott Workman, Armin Hadzic, Xu Zhang, Eric Green, Mei Chen, Reginald Souleyrette, and Nathan Jacobs. "FARSA: Fully Automated Roadway Safety Assessment". In: *IEEE Winter Conference on Applications of Computer Vision (WACV)*. Lake Tahoe, Nevada, March 2018.

Professional Experience

Research.....

Computer Vision Researcher

2020-Present

JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY

Laurel, MD

- Designed and implemented deep learning methods for applied research in computer vision, remote sensing, medical imaging, and neuroscience.
- Developed models robust to bias in classification of skin diseases, reducing skin tone bias by 7% while maintaining 85% accuracy.
- Integrated geospatial products into artificial neural networks for high resolution building damage classification, structure localization, and green house gas regression.

Research Assistant

UK COMPUTER VISION LAB

2018-2020

Lexington, KY

- Advised by Associate Professor Nathan Jacobs.
- Designed multi-modal neural networks to leverage point clouds and satellite imagery to estimate free-flow speeds of roads.
- Developed Natural Language Processing (NLP) temporal convolutional and attention-based neural network models to estimate firm economic performance using public SEC text reports.

Machine Perception Intern

JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY

2019

Laurel, MD

- Advised by Ryan Mukherjee and Dr. Gordon Christie.
- Regressed population of displaced communities for disaster relief efforts, utilizing overhead imagery and deep neural networks.

Volunteer Machine Learning Research Assistant

UK COMPUTER VISION LAB

2017-2018

Lexington, KY

- Automated the US Road Assessment Program (usRAP) road safety assessment using a deep convolutional neural network to directly estimate roadway safety based on street-level panorama images, reducing evaluation time to milliseconds per image.
- Integrated the roadway safety estimator into a GPS vehicle routing system to enhance navigation with the capability to identify a balanced, safe and fast, driving route.

Industry.....

Software Development Engineer

BELCAN ENGINEERING GROUP INC.

2017-2018

Lexington, KY

- Developed, maintained, and tested a jet engine diagnostic and fault resolution system, saving over \$100,000 by automating engine maintenance diagnostics.
- Integrated and streamlined a legacy cross-platform build system with modern development tools, mitigating build errors and reducing development time.

Embedded Software Engineer

BELCAN ENGINEERING GROUP INC.

2016-2017

Lexington, KY

- Streamlined the user interface and reduced diagnostic time of jet engines by identifying, isolating, and purging Onboard Maintenance System inefficiencies and defects.

Software Test Engineer

BELCAN ENGINEERING GROUP INC.

2015-2016

Lexington, KY

- Designed and implemented Control and Diagnostic System Verification and Validation Tests for 4 P&W Turbofan Jet Engines.
- Discovered mission critical control logic, software, and documentation defects through root-cause analysis, informal testing, regression testing and system testing; leading to best in class, safe, and high performance jet engines.

Founder and Software Developer

CHANGING TABLE APP

2015

Lexington, KY

- Developed an Android application to aid users in locating men's washrooms containing changing tables in order to alleviate the stress of searching for baby friendly environments.

Software Engineering Co-op

TEMPUR SEALY INTERNATIONAL INC

2013-2014

Lexington, KY

- Pioneered and developed a GUI and 3D topography mapping application to visually analyze large datapoint datasets, generating streamlined product testing, seamless user experience, and refined product quality.

Software Engineering Intern

JOHNSON CONTROLS INC

2012

Florence, KY

- Designed and implemented a software algorithm for streamlined Automated Guided Vehicle (AGV) routing, saving \$57,000 per year in scrap reduction and transportation costs.

Technical skills

Programming Languages	C/C++, Python, Verilog, Java, L ^A T _E X, Assembly, Make
Libraries	PyTorch, Scikit-Learn, Keras, Tensorflow
Operating Systems	Unix/Linux, Windows, OSX, Android
Development Environments	Linux Toolchain, Jupyter, PyCharm, Visual Studio, Android Studio, Xilinx

Service

- 2021 Technical Committee member for University of Maryland Honor's program Gemstone thesis defense.
- 2019 Mentored high school student in machine learning research, who successfully transitioned to studying at MIT.