# Armin Hadzic

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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]  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.

[2]  Armin Hadzic, Gordon Christie, Jeffrey Freeman, Amber Dismer, 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.

[3]  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*
- Developing deep learning methods for applications in computer vision, remote sensing, medical imaging, and neuroscience.

**Research Assistant**                                              **2018-2020**
UK Computer Vision Lab                                              *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**                                       **2019**
Johns Hopkins University Applied Physics Laboratory                  *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**                                    **2017-2018**

UK Computer Vision Lab                                                                 *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**                                                      **2017-2018**

Belcan Engineering Group Inc.                                                          *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**                                                        **2016-2017**

Belcan Engineering Group Inc.                                                          *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**                                                            **2015-2016**

Belcan Engineering Group Inc.                                                          *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**                                                    **2015**

Changing Table App                                                                    *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**                                                        **2013-2014**

Tempur Sealy International Inc                                                         *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**                                                       **2012**

Johnson Controls Inc                                                                  *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

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| Programming Languages | C/C++, Python, Verilog, Java, LaTeX, 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 |