Ranya Almohsen | Curriculum Vitae

Lane Department of Computer Science and Electrical Engineering
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PhD student in Computer Science. Passionate about science, computer vision, and machine learning. I am always looking for an opportunity to do better and achieve greatness. I thrive on challenge and constantly set goals for myself. My research focus is on generative models open-set and novelty detection

Education

- **PhD in Computer Science** — **Morgantown**
  West Virginia University, WV — *2014–Present*
  Lane Department of Computer Science and Electrical Engineering. Working on Computer Vision problems with the focus on open set classification and novelty detection.

- **Master of Science in Computer Science** — **Morgantown**
  West Virginia University, WV — *2012–2014*
  Thesis title:Human Interaction Recognition with Audio and Visual Cues

- **Bachelor Degree of Computer Science** — **Riyadh**
  King Saud University, KSA — *2002–2007*
  Thesis title: Inheritance law System to Help Court Cases.

Professional Experience

- **Graduate Research Assistant** — **Morgantown**
  West Virginia University, WV — *August 2014–Present*
  Lane Department of Computer Science and Electrical Engineering. Researching new ways to use deep learning to develop computer vision and machine learning models that solve open-set recognition and novelty detection
- **Junior programmer/Developer** — **Khobar**
  Soroof International Company, KSA — *June 2008 – December 2010*
  Analyzed user, business requirements, designed and implemented appropriate solutions. Specifically developed governmental applications using Oracle database (SQL, PL/SQL, Developer, Report) SQL server. Worked in a team atmosphere under pressure to deliver the products on time.

Research Projects

- **Open-set Recognition with Adversarial Autoencoders** A deep learning approach to solve the problem of open-set recognition, by leveraging an encoder-decoder network architecture in conjunction with a multi-class classifier. The network enables learning a novelty detector that computes the probability of a sample to belong to one of the known classes versus being unknown. If known, the multi-class classifiers assigns the class label to the sample.
- **Probabilistic Novelty Detection with Adversarial Autoencoders** Developed a new probabilistic framework for novelty and anomaly detection which led to a NeurIPS publication. Introduced novel architecture that combines adversarial autoencoder with GAN. The implementation uses Pytorch and publicly available on github. An extensive set of results show that the approach improves state-of-the-art results on several benchmark datasets. Resulted. Extension of the approach applied for open-set recognition resulted into WiML workshop publication.
- **Human Identification by Face and Clothing** This project solved the problem of searching for a person

in a large video and improved human identification by fusing the face modality with a pseudo-modality such as the clothing appearance of individuals.The clothing appearance is not a biometric trait. However, its effective way in matching the identity of people that between sightings have not changed their clothes . The objectives of this research include (i) developed a human identification approach jointly based on the face modality and the pseudo-modality of clothing appearance, and demonstrated the performance of the joint face-clothing approach on our surveillance video archive.

Technical and Personal skills

- **Programming Languages:** Python, Java, MATLAB, C, C++,
  Have experience with: C#, Objective C, x86 Assembly.
- **ITools & Technologies:** PyTorch, Tensorflow, NumPy, Scikit-Learn, git, Adobe Illustrator, Latex.
- **Database:** Oracle, SQL, PL/SQL.
- **Platforms:**Linux (Ubuntu), OS X, Windows.

Honors

- National Science Foundation (NSF) WiML Grant. 2018
- Presidential Award for Excellence in Scholarship, West Virginia University. 2012
- Ministry of Higher Education Scholarship, Saudi Higher Education Ministry. 2012

Professional Service

Reviewed papers for CVPR, ECCV, BMVC, ICIP, ICIAR, and WiML. IEEE student member.

References

Prof. Dr. Gianfranco Doretto
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Publications

Ranya Almohsen, Stanislav Pidhorskyi, and Gianfranco Doretto. Open-set recognition with adversarial autoencoders. In *WiML Workshop*, 2018.

Stanislav Pidhorskyi, Ranya Almohsen, and Gianfranco Doretto. Generative probabilistic novelty detection with adversarial autoencoders. In *Advances in Neural Information Processing Systems*, pages 6821–6832, 2018.

Saeid Motiian, Farzad Siyahjani, Ranya Almohsen, and Gianfranco Doretto. Online human interaction detection and recognition with multiple cameras. *IEEE Transactions on Circuits and Systems for Video Technology*, 27(3):649–663, 2017.

Farzad Siyahjani, Ranya Almohsen, Sinan Sabri, and Gianfranco Doretto. A supervised low-rank method for learning invariant subspaces. In *Proceedings of the IEEE International Conference on Computer Vision*, pages 4220–4228, 2015.