SHAYAN ALI AKBAR

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SUMMARY

– PhD student with extensive hands-on experience in many computer programming languages and tools
– Seeking summer internship opportunity in software engineering
– Interested in solving software engineering problems through machine learning techniques
– Previously worked in 3-D modeling, computer vision, and image processing

EDUCATION

PhD, Electrical and Computer Engineering, Purdue University, IN, USA
June 2015 - present
Areas: information retrieval, software engineering, bug localization

MS, Electrical and Computer Engineering, Purdue University, IN, USA
August 2013 - May 2015
Areas: computer vision, 3-D modeling, image processing

BE, Electrical Engineering, NED University of Engineering and Technology, Pakistan
January 2009 - December 2012
Areas: face recognition, hidden Markov model, GPU programming

EXPERIENCE

Research Assistant, Robot Vision Lab @ Purdue University, West Lafayette, IN
June 2014 - present

Bug Localization using Information Retrieval:

- Developed a technique which uses Markov Random Fields (MRF) to model inter-term dependencies for information retrieval based bug localization
- MRF modeling significantly outperforms simple bag-of-words BOW models for source code retrieval
- Exploited structural information present in bug reports to improve bug localization
- Performed an extensive comparative study of popular term-term dependency models for bug localization
- The study concludes that MRF modeling is far superior than other inter-term dependency models
- Developed a graphical user interface for the bug localization software
- Working on developing an incremental update framework for MRF modeling which will keep the indexes of the software repository updated whenever there is a modification to the software source code

Prior Experience in Computer Vision Involving Complex Data Modeling:

- Experimented with Microsoft KinectFusion for 3-D reconstruction of trees
- Developed a method for registration of front and back side point clouds of tree
- Developed a method for estimating the 3-D model of a tree using a single depth image
- Developed a method for accurate 3-D modeling of trees using several depth images

Teaching Assistant, Purdue University, West Lafayette, IN
August 2016 - December 2016

Graduate Level Course on Computer Vision:

- Prepared homeworks and organized their submissions and exam schedule
- Added new homeworks to the course curriculum
- Conducted biweekly office hour sessions

TECHNICAL STRENGTHS

Languages	Java, Python, MATLAB, C, C++, Scheme, CUDA
Operating Systems	Windows, Linux
IDEs	NetBeans, Visual Studio, Eclipse, PyCharm, Emacs
Documentation Tools	LaTeX, MS-Office

SELECTED PROJECTS

- Information Retrieval for Bug Localization (JAVA)
- 3D-Modeling of Dormant Apple Trees (MATLAB/C++)
- Modeling the parameters of a camera using Zhang's Algorithm (Python)
- CUDA-Accelerated Face Recognition Using Hidden Markov Models (C/CUDA)
- PCA vs. LDA for Face Recognition (MATLAB)
- Object Recognition and Digit Recognition Using Convolutional Neural Network (MATLAB)
- Traffic Engineering in Software Defined Network (SDN) (Python)
- MapReduce on MPI and OpenMP (C)

SELECTED PUBLICATIONS

Publications in Automatic Bug Localization:

- Bunyamin Sisman, Shayan A. Akbar and Avinash C. Kak, **Exploiting spatial code proximity and order for improved source code retrieval for bug localization**, Journal of Software: Evolution and Process, 2016.
- Shayan A. Akbar, and Avinash Kak, **Source code retrieval using term-term dependency models: A comparative study for bug localization**, The 14th International Conference on Mining Software Repositories, (submitted)

Prior Publications in Other Areas:

- Henry Medeiros, Donghun Kim, Jianxin Sun, Hariharan Seshadri, Shayan Ali Akbar, Noha M. Elfiky, Johnny Park, **Modeling dormant fruit trees for agricultural automation**, Journal of Field Robotics, 2016.
- Somrita Chattopadhyay, Shayan A. Akbar, Noha M. Elky, Henry Medeiros, and Avinash Kak, **Measuring and modeling apple trees using Time-of-Flight data for automation of dormant pruning applications**, IEEE Winter Conference on Applications of Computer Vision (WACV), 2016, Lake Placid, NY, USA.
- Shayan A. Akbar, Noha M. Elfiky, and Avinash Kak, **A novel framework for modeling dormant apple trees using single depth image for robotic pruning application**, International Conference on Robotics and Automation (ICRA) 2016, Stockholm, Sweden.