SHAYAN ALI AKBAR

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Visa Status: F-1

SUMMARY

- PhD student with extensive hands-on experience in many computer programming languages and tools
- Interested in solving information retrieval, data science, and machine learning problems
- Active in research community — publishing papers, attending conferences and reviewing papers

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: Machine learning, face recognition, probabilistic modeling

EXPERIENCE

Graduate Intern Technical @ Intel Corporation, Hillsboro, OR
May 2017 - Dec 2017

Performance modeling and bottleneck analysis:

- Developed a tool using **LSTM** for modeling performance of complex **multicore SOC architecture**
- Gathered traffic flow, queue occupancy, and latency measurements from simulation runs for training LSTM network
- The developed tool can learn the internal dependencies in the data just by using the traffic flow information
- Used **Random Forest** to identfy the queues which cause bottleneck for certain types of traffic

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

Source code retrieval:

- Studied different techniques to retrieve source code files given software search queries
- Improved precision using **Markov Random Fields (MRF)** to exploit ordering relationships between software terms
- Performed a comparative study of several models other than MRF that incorporte such relationships
- Improved precision by exploiting structured information like stack trace present in the search queries
- Modeling semantic relationships between software terms to further improve retrieval precision

3-D Modeling of Dormant Fruit Trees:

- Published a new dataset of depth and color images of dormant apple trees obtained from several orchards
- Experimented with **Microsoft KinectFusion** for 3-D reconstruction of trees and noted its limitations
- Studied the noise and distortion present in the depth image obtained from Kinect 2 sensor
- Studied lens-distortion or fish-eye effect in depth images and its removal technique using sensor calibration
- 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 3-D modeling of trees from depth images using **Iterative Closest Point (ICP)** algorithm

- Assisted in designing a user-friendly GUI for farmers to get acquainted with pruning process

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

Graduate Level Course on Computer Vision:

- Prepared new homeworks
- Organized the homework submission and exam schedule
- 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

SYNERGISTIC ACTIVITIES

- Presented in international conferences including CVPR and ICRA
- Also frequently participated and presented in informal intralab seminars
- Reviewed manuscripts that were submitted for journal publications

RELEVANT COURSEWORK

Graduate	Undergraduate	Independent/Online
Computer Vision	Programming with C	Artificial Intelligence
Neural Networks	Microprocessor & Assembly Lang.	(Stanford online 2011)
Image Processing	Computer Architecture	Heterogeneous Parallel Processing
Algorithms	Digital Signal Processing	(Illinois online 2012)
Parallel Programming	Communication Systems	PIC Microcontrollers
Computer Network Systems	Feedback Control Systems	(iDigitalBit 2011)

SELECTED PROJECTS

- MiST: Mining Software Toolkit (Python)
- Source code retrieval using novel retrieval models (JAVA, Extended Terrier)
- 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

- 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, Somrita Chattopadhyay, Noha M. Elky, and Avinash Kak, **A novel benchmark RGBD dataset for dormant apple trees and its application to automatic pruning**, IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, Las Vegas, NV, USA, 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.