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AWARDS & ACHIEVEMENTS

Microsoft Research Project Prize for best MSc. Computer Graphics, Vision and Imaging thesis at UCL (2010).

BBC Best Overall Student Prize in MSc. Computer Graphics, Vision and Imaging at UCL (2010).

Software Design Finalist for Microsoft Imagine Cup 2007 Korea. The project on Automated Video Recording of Lectures (AVRiL) was selected to represent Pakistan for the first time in this prestigious invitational.

Mentor Graphics Project Award for AVRiL - best BSc. senior year project (2007).

EDUCATION

Georgia Institute of Technology Aug. '11 - (to date)
Computer Science Ph.D. candidate, School of Interactive Computing

University College London (UCL) Sept. '09 - Sept. '10
MSc. Computer Graphics, Vision and Imaging - *Distinction*

Lahore University of Management Sciences (LUMS) Aug. '03 - July '07
BSc. (Hons.). Computer Engineering (Major) - *High Merit*

PROFESSIONAL EXPERIENCE

Georgia Institute of Technology *Graduate Research Assistant*, Computational Perception Lab. Aug. '11 - (to date)

Facebook AI Research, Menlo Park *Research Intern* with Manohar Paluri and Piotr Dollár May '15 - July '15

Microsoft Research, Redmond *Research Intern*, Multimedia, Interaction, & Communication group May '14 - July '14

The University of Warwick *Research Associate*, Dept. of Computer Science Sept. '10 - Dec. '10

Lahore University of Management Sciences *Research Associate*, Dept. of Computer Science Jan. '07 - July '09

MobileWeaver ApS *Junior Software Developer*, Technical Department March '08 - Jan. '09

PUBLICATIONS

Iterative Machine Teaching. (3rd author)

International Conference on Machine Learning (ICML) - Aug. '17. ahumayun.com/pubs/itermteach17

Multiple-Instance Video Segmentation with Sequence-Specific Object Proposals. (3rd author)

The 2017 DAVIS Challenge on Video Object Segmentation - CVPR Workshops - July '17. ahumayun.com/pubs/davisvid17

The Middle Child Problem: Revisiting Parametric Min-cut and Seeds for Object Proposals. (1st author)

International Conference on Computer Vision (ICCV) - Dec. '15. rehg.org/poise

Finding Temporally Consistent Occlusion Boundaries in Videos using Geometric Context. (2nd author)

IEEE Winter Conference on Applications of Computer Vision (WACV) - Jan. '15. cpl.cc.gatech.edu/projects/temporaloccl/

RIGOR: Recycling Inference in Graph Cuts for generating Object Regions. (1st author)

IEEE Conference on Computer Vision and Pattern Recognition (CVPR) - June '14. cpl.cc.gatech.edu/projects/RIGOR/

Video Segmentation by Tracking Many Figure-Ground Segments. (3rd author)

International Conference on Computer Vision (ICCV) - Dec. '13. cc.gatech.edu/~fli/SegTrack2/

Learning a Confidence Measure for Optical Flow. (2nd author)

IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI) - May '13. visual.cs.ucl.ac.uk/pubs/flowConfidence

A Novel Paradigm for Mining Cell Phenotypes in Multi-Tag Bioimages

using a Locality Preserving Nonlinear Embedding. (2nd author)

International Conference on Neural Information Processing (ICONIP) - Nov. '12. ahumayun.com/pubs/cellembbed12

RAMTaB: Robust Alignment of Multi-Tag Bioimages. (2nd author)

PLoS ONE - Feb. '12. journals.plos.org/plosone/article?id=10.1371/journal.pone.0030894

A Framework for Molecular Co-Expression Pattern Analysis

in Multi-Channel Toponome Fluorescence Images. (1st author)

Microscopy Image Analysis with Apps. in Biology (MIAAB) - Sept. '11. ahumayun.com/pubs/coexprstis11

Towards Protein Network Analysis Using TIS Imaging and Exploratory Data Analysis. (3rd author)

Workshop on Computational Systems Biology (WCSB) - June '11. ahumayun.com/pubs/tisdata11

PUBLICATIONS (*Contd.*)**Learning to Find Occlusion Regions.** (1st author)

IEEE Conference on Computer Vision and Pattern Recognition (CVPR) - June '11. visual.cs.ucl.ac.uk/pubs/learningOcclusion/

Myosin Motors Drive Long Range Alignment of Actin Filaments. (3rd author)

Journal of Biological Chemistry - Feb. '10. www.jbc.org/content/285/7/4964.abstract

RESEARCH PROJECTS

Video Object Detection at Georgia Institute of Technology (*Ph.D. thesis*)

Currently researching on combining motion and appearance cues for localization in video. The goal is to develop deep architectures for generating proposals amenable for detecting and tracking objects. Tools: Lua Torch, Python, C++

Optimization for Object Segmentation at Georgia Institute of Technology (as *Ph.D. student*)

Research on combinatoric optimization techniques for object segmentation in videos and images. Tools: MATLAB, C++

Video Supervision for Generating Video Proposals at Facebook AI Research

Research on generating video proposals by unsupervised discovery of objects in large scale video datasets. Tools: MATLAB, Python, C++, Javascript, PHP

Object Proposals for CT Images at Georgia Institute of Technology (as *Ph.D. student*)

Supervising a project for generating segmentation proposals in 3D CT scans, leading to detection of organs.

Crowd Tracking with Multiple Depth Sensors at Microsoft Research

Developed a large area, crowd tracking system by fusing data from multiple depth sensors. Tools: KINECT SDK, C++

Detecting Occluded Regions at UCL (*MSc. thesis*)

Worked on a supervised learning method to detect regions of occlusion in a two frame sequence. Tools: MATLAB

Tracking Techniques using Object's Shape Cues at LUMS

Researched tracking techniques for accurate generation of trajectories using object's non-rigid shape descriptors, resilient to occlusion. This was partly funded by NSF. (ahumayun.com/crspd) Tools: MATLAB

Molecular Pattern Analysis of Cancerous Colon Cells at The University of Warwick

A multi-disciplinary project for the detection of cancerous tissue. We developed registration and non-linear embedding techniques for analysis of tissues from a multidimensional imaging process. Tools: MATLAB

Automated Video Recording of Lectures - AVRiL at LUMS (*senior year project*)

Developed an automated *director* that captures a multi-camera lecture environment. (avril.sproj.com) Tools: OpenCV

Improvements in Google's MapReduce Architecture at LUMS

Research enabling MapReduce to run speculatively on skewed input data. (tinyurl.com/q3detyg) Tools: Python, HADOOP

Surveillance Video Compression through Foveation as a *research initiative*

Researched the development of a novel H.264 encoder which assigns more bits to areas where the human visual system is more likely to foveate in surveillance footage. (<http://suraj.lums.edu.pk/~foveation>) Tools: JAVA Media Framework

SKILLS & INTERESTS

Proficient in Python, MATLAB, Lua, C++, OpenCV | Rock climbing, photography, solving puzzles, and cycling.

REFERENCES

Prof. James M. Rehg

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