

POSTDOCTORAL ASSOCIATE · COMPUTER VISION AND SENSING SYSTEMS (COVISS), ABE, UNIVERSITY OF FLORIDA

☎ +1 (352) 721-8879 | ✉ usmanmagbool@outlook.com | 🏠 usmanmagbool.github.io | 👤 [UsmanMagbool](#)

1

Autonomous Systems Lab (ASL)

ETH Zürich, Switzerland.

Academic Guest

Oct. 2019 - Mar. 2020

- Supervisor: **Prof. Roland Siegwart**, Director of Autonomous Systems Lab (ASL), ETH Zürich, Switzerland.
- Co-Supervisor: **Dr. Cesar Dario Cadena Lerma**, Senior Researcher at ASL, ETH Zürich, Switzerland.
- **Research in Place Recognition**: I've worked for making the better place recognition for the better scene understanding. Furthermore, I've also introduced light weight representation of key-frames for better channel utilization.

Department of Electronics

QAU, Pakistan

MPhil

Mar. 2010 - Jun. 2012

- M.Phil. Supervisor: **Prof Hasan Mahmood**, Department of Electronics, QAU.
- **Research in Image Processing (CNN)**: I've introduced CNN-based license plate recognition of Pakistani's Cars. This work has been published in IEEE-ICALIP 2014.

Industry and Entrepreneurship

Lisee Technology Corporation Limited

Central, HK

COO

Jan 2018 - Jan 2021

- Won funding support for company | TSSSU Support HK\$ 300,000 (Jun 19 - May 20).
- Indoor Navigation for Libray using Lisee Technology | PCF Support HK\$ 160,000 (Jun 18 - May 19).

Friends Corporate Technologies

Islamabad, PK

CEO

Feb 2013 - Aug. 2015

50+ Projects | Electronics/ Electrical Engineering, R&D, image processing, Web Applications Development, MVC Applications

Federal Government of Pakistan

Islamabad, PK

Scientific Officer

May 2012 - Feb 2013

Electronics/ Electrical Engineering, R&D, image processing

Server4Sale, LLC

Islamabad, PK

PHP Developer

Dec 2009 - Mar 2010

Php web application development for Joomla and Zend frameworks.

Academic

Department of Computer Science

BZU-Sahiwal, Pakistan

Lecturer (Visiting)

Feb 2016 - Jun 2016

Teaching MCS and BS-CS courses

Department of Physics

GPGC Sahiwal, Pakistan

CTI

Oct. 2015 - May. 2016

Teaching BS physics (Electronics related courses + Labs + Projects)

Department of Electronics

QAU, Pakistan

Instructor

Aug. 2010 - Dec. 2010

'PHP Web Development' (a short course) offered in Department of Electronics, Quaid-i-Azam University, Islamabad, Pakistan.

Education

Ph.D. in Robotics and AI at RAM-LAB, Robotics Institute

HKUST, Hong Kong

Department of Electronic & Computer Engineering, The Hong Kong University of Science and Technology

Sep 2016 - Jun 2021

- **Thesis**: "Towards A Swift Multiagent SLAM System For Large-scale Robotics Applications", June 17, 2021
- PhD Supervisor: **Prof Ming Liu**, Director of Robotics and Multi-Perception Lab (RAM-LAB)
- Exchange Supervisor: **Prof. Roland Siegwart**, Director of Autonomous Systems Lab (ASL), ETH Zürich, Switzerland.
- Exchange Co-Supervisor: **Dr. Cesar Dario Cadena Lerma**, Senior Researcher at ASL, ETH Zürich, Switzerland.
- Got PEEF CCMS PhD scholarship from Pakistan and overseas research award (ORA).
- Research: Multi-Agent SLAM System, Place Recognition, Autonomous Car and Deep Learning for automation industry. Hand on experience on RGB-D 3D reconstruction, Multi-view stereo, python and C++ development experience, multi-threaded coding, 3D mesh registration, paraview and parameterizations. Moreover, I've deep understanding of data structures and algorithms. Experience with software development on Linux open-source stack. Calculus, linear algebra and geometry related courses have been taken.

M.Phil. in Electronics

QAU, Pakistan

Department of Electronics, Quaid-i-Azam University, Islamabad, Pakistan.

Mar 2010 - Jun 2012

- **Thesis**: "A Feature Based Algorithm for Automobile License Plate Detection and Recognition in Pakistan", Mar, 2012
- M.Phil. Supervisor: **Prof Hasan Mahmood**, Department of Electronics, QAU.
- Research: Signal and Image Processing
- Grade: A

M.Sc. in Electronics

Department of Electronics, Quaid-i-Azam University, Islamabad, Pakistan.

QAU, Pakistan

Sep 2007 - Jun 2010

- **2nd position** in batch
- Projects: completed 9+ projects related to C++, Verilog/HDL and Micro-controller programming.

B.Sc. in Mathematics and Physics

Bahauddin Zakariya University, Multan Pakistan

BZU, Pakistan

Sep. 2005 - Aug. 2007

- Grade: 1st Division

Honors & Awards

| | | |
|------------|--|-----------------|
| July, 2021 | Educational Technology Innovation: Gold Award , The Teaching and Learning Innovation Expo, CUHK | CUHK, Hong Kong |
| July, 2021 | Pedagogical Innovation: Silver Award , The Teaching and Learning Innovation Expo, CUHK | CUHK, Hong Kong |
| July, 2018 | Best Student Paper Finalist Award , IEEE Int. Conf. on CYBER Technology in Automation, Control, and Intelligent Systems | Tianjin, China |
| May, 2018 | Audience Award , Campus Challenge - Transportation, HKUST | HKUST, HK |
| Nov, 2017 | Best Mapper Award , Robotics and Multi-Perception Lab, HKUST | Shenzhen, China |
| May, 2017 | Completion Award , The Graduate Teaching Assistant Training, HKUST | HKUST, HK |
| Dec, 2016 | Best External Award , Robotics and Multi-Perception Lab, HKUST | Shenzhen, China |
| Nov, 2016 | Completion Award , Author Workshop, Elsevier Publishing Campus | HKUST, HK |
| Sep 2016 | CCMS PhD Scholarship , Won Chief Minister Marit Scholarship (CCMS) scholarship award by Punjab Government (PEEF), Pakistan for pursuing my PhD studies at HKUST, HK | Lahore, PK |
| Sep 2013 | Participant , Painting for peace (Pakistan-India-Afghanistan) event, a part of the Harmony initiative | Islamabad, PK |
| Apr 2013 | Participant , Case Spark in business plan competition | Islamabad, PK |
| Apr 2013 | Participant , Case EPICA | Islamabad, PK |
| Apr 2013 | Participant , How to be a Better Playwright Workshop by PNCA and US Embassy Pakistan | Islamabad, PK |
| Oct 2012 | Participant , Punjab Youth Festival | Lahore, PK |
| Oct 2011 | Participant , Int'l Youth Conference and Festival | Islamabad, PK |
| Sep 2011 | Participant , Asian Youth Conference and Peace Festival | Lahore, PK |
| Apr 2011 | Completion Award , Acting and Directing Theater Workshop by PNCA and US Embassy Pakistan | Islamabad, PK |
| Dec 2011 | Participant , National Drama Festival | Islamabad, PK |
| Dec 2010 | Instuctor of short Course , PHP Web Development' at the Department of Electronics, QAU | Islamabad, PK |
| Apr 2013 | Completion Award , Running River Rafting course by Adventure Foundation of Pakistan | Mansehra, PK |
| Apr 2013 | Completion Award , Paragliding course by QAU Adventure Club | Islamabad, PK |
| Dec 2008 | Award of Honor , Finance Secretary of Electronics Student Society (ESS) at QAU | Islamabad, PK |

Presentation

Navigating Academia Research & Industry, ITCN Asia 2023

Pak-China Friendship Centre,
Islamabad

Panelist

Feb. 2023

- 'I emphasize taking the voluntary initiative by the tech industry first. Companies should realize that they need academic involvement to grow at a swift pace. Most VPs of big companies belong to academia.
- 'In return, companies would at least solve their quality hiring problems. Usually, universities need more funding for R&D and IP filings, etc. In a broader view, both could get huge benefits.

Teaching and Learning Innovation Expo 2021

CUHK, Hong Kong

Posters Presentation

Jul. 2021

- 'Mixed Reality in Hands-On Learning of Robotics' by Xinyan Zhao, Sabrina Lam, M. Usman M. Bhutta, Darwin Lau and Jimmy Lee.
- 'Online Robotics Laboratory Framework for Interactive and Group Hands-On Learning' by Ken Hui, Ken Kwok, M. Usman M. Bhutta, Darwin Lau and Jimmy Lee.

IEEE/RSJ International Conference on Intelligent Robots and Systems [IROS, 2020]

Las Vegas, USA

Presenter as author

Oct. 2020

- Introduced **Smart-Inspect** for the micro scale localization and classification of smartphone glass defects for industrial automation.

Technology Start-up Support Scheme for Universities (TSSSU)

HKUST, Hong Kong

Presenter as COO Lisee Technology Corporation Company Limited, Hong Kong.

Jan. 2019

- Introduced Lisee technology in front of selection committee panel and won TSSSU 2019-20 funding of the amount of HK\$300,000.

IEEE Int. Conf. on CYBER Technology in Automation, Control, and Intelligent Systems [IEEE-CYBER 2018]

Tianjin, China

Presenter as author

Jul. 2018

- Introduced PCR-Pro for the estimation of information matrix and scale difference for pose graph SLAM.

IET-Young Professionals Exhibition and Competition (IET-YPEC) 2018

CityU, Hong Kong

Presenter as COO Lisee Technology Corporation Company Limited, Hong Kong.

Jul. 2018

- Introduced Lisee technology at IET-YPEC 2018.

Campus Challenge @ HKUST Transportation

HKUST, Hong Kong

Presenter as participant

May 2018

- HKUST got 80+ proposals for this competitions, and arranged a roadshow. My proposal got selected for the audience award after getting maximum votes.

High Tech Innovation and Entrepreneurship

HKUST, Hong Kong

Presenter as Entrepreneur

Dec. 2017

- Introduced my study related to the flying cars.

World First Youth Robotics Developemnt Forum 2017

Shangri-La Shenzhen, China.

Presenter as author.

Nov. 2017

- Introduced my work related to multi-agent SLAM system.

Scientific Review Services and Academic Services

Journal Referee Services

| | |
|------|--|
| TJS | Peer Reviewer , The Journal of Supercomputing |
| RA-L | Peer Reviewer , IEEE Robotics and Automation Letter |
| TC | Peer Reviewer , IEEE Transactions on Cybernetics |

2024

2024, -23, -22

2022

Conference Referee Services

| | |
|--------|--|
| IROS | Peer Reviewer , IEEE/RSJ RA-L and International Conference on Robotics and Automation |
| ICRA | Peer Reviewer , IEEE/RSJ International Conference on Robotics and Automation |
| UF, US | Poster Judge , UF/IFAS Agricultural and Biological Engineering Poster Symposium |

2024, 23, 21, 20, 18

2024, 23, 22, 21, 20

2024

Teaching Assistant Positions

| |
|---|
| HKUST, HK Teaching Assistant , EESM 5547 - Multimedia Signal Processing |
| HKUST, HK Teaching Assistant , ELEC4820 - Medical Imaging |
| HKUST, HK Teaching Assistant , ELEC 1010 - Electronic and Information Technology |

Spr 2020, Spr 2019,

Spr 2018

Fall 2018

Spr 2017

Skills

| | |
|---|--|
| Robotics and Computer Vision | Ubuntu, ROS, PCL, Docker, Catkin, OpenCV, OpenGV, Ceres Solver, g2o, Libpointmatcher |
| Machine Learning / Deep Learning | Jupyter, Pytorch, Tensorflow, Keras, CUDA, Cluster (Hipergator) |
| Programming | Python, C/C++, Matlab, git, LaTeX, FPGA, Verilog, Slurm |
| Web | mkdocs, Hugo, Jekyll, PHP, MYSQL |
| Languages | English, Urdu |

Research

G: [Google Scholar](#) | ORCID ID: 0000-0002-3512-4279

Journal Publications

In-Sensor Visual Perception and Inference

Journal

Yanan Liu and Rui Fan and Jianglong Guo and Hepeng Ni and M. Usman Maqbool Bhutta
2023 Intelligent Computing

Jul 2023

Robust mobile robot navigation in cluttered environments based on hybrid adaptive neuro-fuzzy inference and sensor fusion

Journal (IF: 8.8+)

Muhammad Husnain Haider, Zhonglai Wanga, Abdullah Aman Khan, Hub Ali, Hao Zheng, Shaban Usman, Rajesh Kumar, M. Usman Maqbool Bhutta, Pengpeng Zhi
2022 Journal of King Saud University-Computer and Information Sciences.

Aug 2022

MAFNet: Segmentation of Road Potholes with Multi-modal Attention Fusion Network for Autonomous Vehicles

Zhen Feng, Yanning Guo, Qing Liang, M. Usman Maqbool Bhutta, Hengli Wang, Ming Liu, and Yuxiang Sun

Journal (IF: 5.3+)

Aug 2022

2022 IEEE Transactions on Instrumentation & Measurement

Why-So-Deep: Towards Boosting Previously Trained Models for Visual Place Recognition

M Usman Maqbool Bhutta*, Yuxiang Sun, Darwin Lau and Ming Liu

Journal (IF: 5.4+)

Jan 2022

IEEE Robotics and Automation Letters (RA-L)/ICRA, 2022

Loop-box: Multi-Agent Direct SLAM Triggered by Single Loop Closure for Large Scale Mapping

M Usman Maqbool Bhutta*, Manohar Kuse, Rui Fan, Yanan Liu and Ming Liu

Journal (IF: 11.7+)

Oct 2020

2022 IEEE Transactions on Cybernetics

Efficient Reset Design Techniques

Qamar, Zoha, Bushra Yaseen, and Usman Maqbool

Journal Paper

2015

Published in Science International Lahore

Conference Proceedings

Autonomous Mobile Robot Navigation using Adaptive Neuro Fuzzy Inference System

Muhammad Husnain Haider and Hub Ali and Abdullah Aman Khan and Hao Zheng and M. Usman Maqbool Bhutta and Shaban Usman and Pengpeng Zhi and Zhonglai Wang

Conference Paper

May 2022

2022 International Conference On Innovations And Development Of Information Technologies And Robotics (IDITR), 2022

Scale-Adaptive Pothole Detection and Tracking from 3-D Road Point Clouds

Wu, Rigen and Fan, Jiahe and Guo, Libo and Qiao, Lei and Bhutta, M. Usman Maqbool and Hosking, Brett and Vityazev, Sergey and Fan, Rui

Conference Paper

Aug 2021

2021 IEEE International Conference on Imaging Systems and Techniques (IST), 2021

Smart-Inspect: Micro Scale Localization and Classification of Smart Phone Glass Defects for Industrial Automation

M Usman Maqbool Bhutta*, Shoaib Aslam, Peng Yun, Jianhao JIAO and Ming Liu

Conference Paper

Oct 2020

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2020)

Multiple Lane Detection Algorithm Based on Optimised Dense Disparity Map Estimation

Han Ma, Yixin Ma, Jianhao Jiao, M Usman Maqbool Bhutta, Mohammud Junaid Bocus, Lujia Wang, Ming Liu and Rui Fan

Conference Paper

Dec 2018

Accepted in IEEE International Conference on Imaging Systems and Techniques (IST 2018)

PCR-Pro: 3D Sparse and Different Scale Point Clouds Registration and Robust Estimation of Information Matrix For Pose Graph SLAM

M Usman Maqbool Bhutta* and Ming Liu

Conference Paper

Jul 2018

Presented in IEEE Int. Conf. on CYBER Technology in Automation, Control, and Intelligent Systems (IEEE-CYBER 2018), and won **Best Student Paper Finalist Award**.

An intelligent approach for robust detection and recognition of multiple color and font styles automobiles license plates: A feature-based algorithm

M Usman Maqbool Bhutta*, Hasan Mahmood, and Haroon Malik

Conference Paper

Jan 2015

Published in IEEE International Conference on Audio, Language and Image Processing (ICALIP 2014).

Patent

Semi-Supervised Learning Approach for Smart Phone Glasses Defect Inspection

Muhammad Usman Maqbool Bhutta, Jianhao Jiao, Peng Yun, Yuan Wang, Xuebin Sun, Ming Liu

US Patent

Jan 2020

U.S. Provisional Patent Application No. 62/974,937, Filing Date 01/06/2020.

Automatic Surface Defect Detection System for Smart Phone Glass Based on Deep Learning

Yuan Wang, Jianhao Jiao, Peng Yun, Muhammad Usman Maqbool Bhutta, Xuebin Sun, Ming Liu

US Patent

Jan 2020

U.S. Provisional Patent Application No. 62/974,938, Filing Date 01/06/2020.

References

Prof. Henry Medeiros

Associate Professor · Director of Computer Vision and Sensing Systems (COVISS) Lab,
Department of Agricultural and Biological Engineering University of Florida, FL, USA
+1 (352) 294 6706

Postdoc Supervisor

hmedeiros@ufl.edu

Prof. Hafiz Malik

Professor · Director of Information Systems, Security, and Forensics (ISSF), Electrical and
Computer Engineering, University of Michigan-Dearborn, MI, USA.
+1 (313) 593 5677

Research Supervisor

hafiz@umich.edu

Prof. SUN Yuxiang

Professor · Department of Mechanical Engineering City University of Hong Kong, Hong Kong.
(+852) 3442-4775

PhD Co-Supervisor

yx.sun@cityu.edu.hk