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**Academics**

2019-2022 Post-doctorate in Robotics and Computer Vision, BIT, Beijing, China.

2015-2019 PhD in Computer Science and technology from UCAS, ICT, Beijing, China

2013-2015 Master in Electronics Science and Technology, Xi'an Jiaotong University, Xi'an, China.

2008-2012 Bachelor of Information & Communication System Engineering, SEECS, NUST, Pakistan.

| **Teaching Experience** | **Courses Previously taught** |
|---|---|
| Teaching Assistant at NUST, Pakistan(2011) | Fundamentals of Computer Programming(C), Object Oriented Programing(Java), Python for Data Analysis(Python) |
| Lecturer at CUEB, Beijing, China(2022-2024) | Applied Stochastic Process, Statistical Computing(R), Multi Variate Statistics |
| Global-Professor at University of Arizona(currently) | Introduction to Applied Regression and Generalized Linear Models, Foundations of Data Science, Linear Algebra for Data Science, Introduction to Statistical Methods (Courses taken during UofA training) |
| **Teaching Training** | Teaching Training at CUEB(6 months), Teaching Training at UofA(9 months) |

**Research interests and future directions**

- Machine learning, Robot's navigation, Data Science, Computer vision.

**Research Experience**

- A member of HL7 Pakistan research group at NUST, Pakistan (SSRG-LAB), July-2011 till June-2012.
- A member of research group (2013-2015) at the "Key Laboratory for Physical Electronics and Devices of the Ministry of Education & Shaanxi Key Lab of Information Photonic Technique, Xi'an Jiaotong University, Xi'an 710049, China".
- A member of research group at the "State Key Laboratory of Computer Architecture", ICT, CAS, Beijing, China (2016-2019).
- A member of robotics vision research group at Beijing Institute of Technology, China (2019-2022).

**Work Experience**

- Software Engineer at Centre for Innovation and Entrepreneurship, NUST, Islamabad, Pakistan(August, 2012--August, 2013)
- Research Assistant at BIT, Beijing, China(Jan-2022 to Sep-2022)

**Engineering Projects**

- Design, testing and application of a Humanoid-Robot-driver vision system for road detection and self driving.
- Electronics Video/image stabilizationof 7DOF Robotic Bionic Eyes platform.
- Part of the team for preparation of a Robot to participate in ***Advance Technology and engineering challenge*** held at Shenzhen, China in 2020, the robot has to navigate on rough terrain with small stones, cross the water, move up down stairs, Open and cross a door, traverse a reconfigurable maze environment (Got 9$^{th}$ position).
- Collaborative project on key technologies for intelligent grasping of mobile robots (Huawei).

**Honors and Awards**

- Award of Merit based National Outreach scholarship program by the Government of Pakistan for bachelor study.
- Certificate of Merit was awarded on the basis of overall academic performance at NUST, Pakistan.
- Award of Xi'an Jiaotong University Scholarship program for Master Degree.
- Award of the joint President's Fellowship by Chinese Academy of Sciences-The World Academy of Sciences (CAS-TWAS for PhD Degree.

## Technical Skills

- **Computer Languages**: Python, C/C++, C#, PhP, JAVA, R.
- **Operating Systems**: Windows, Linux
- **Robotics Platforms**: Differential Driving Robots, legged robots
- Active Slam, Coverage Path Planning(CPP), Maples Navigation
- **Machine Learning**: RL, ANN, CNN
- **Data Bases**: MYSQL, SQL Server 2008 /2005, SQL-Lite

## Publications

1. **Zakir Ullah**, Xiaopeng Chen, Siyuan Gou, Yang Xu and Muhammad Salam, FNUG: Imperfect mazes traversal based on detecting and following the nearest-to-final-goal and unvisited gaps. IEEE Robotics and Automation Letters, 2022.
2. Q. Wang, X. Chen, Z. Ullah, S. Tang, M. Yu and P. Xu, "TMBC: Topological map based coverage path planner for active exploration of an unknown environment," *2022 IEEE International Conference on Robotics and Biomimetics (ROBIO)*, Jinghong, China, 2022, pp. 1623-1628,doi:10.1109/ROBIO55434.2022.10012015.
3. Mahammad Humayoo, Xiaoqing Dong, Liming Miao, Shuwei Qiu, Zakir Ullah, Relative importance sampling for off-policy actor-critic in deep reinforcement learning, Sciencetific report, 2025.
   keywords: {Navigation;Trajectoryplanning;Robotkinematics;Simulation;Computationalmodeling;Robot sensing systems;Iron},
4. **Zakir Ullah**, Xiaopeng Chen, Mingming Yu, Yang Xu, "TMBE: Topological map based active exploration for 3D reconstruction of an unknown environment", 2024 (Underreview)
5. Xiaopeng Chen, Yanyang Liu, Yang Xu, Siyuan Gou, Siyan Ma, **Zakir Ullah**. Kinematic Calibration of a Laser Tracker based on Nonlinear Optimization of a Refined Geometric Error Model. Measurement, 2021.
6. Fan, Di and Liu, Yanyang and Chen, Xiaopeng and Meng, Fei and Liu, Xilong and **Ullah, Zakir** and Cheng, Wei and Liu, Yunhui and Huang, Qiang, Eye Gaze Based 3D Triangulation for Robotic Bionic Eyes, Sensors, V-20, 2020.
7. **ZakirUllah**, Zhiwei Xu, Zhang Lei, Libo Zhang, WaheedUllah:RL and ANN Based Modular Path Planning Controller for Resource-Constrained Robots in the Indoor Complex Dynamic Environment. IEEE Access 6: 74557-74568 (2018).IF=4.098
8. **ZakirUllah**, Zhiwei Xu, Zhang Lei, Libo Zhang: A Robust Localization, Slip Estimation, and Compensation System for WMR in the Indoor Environments. Symmetry 10(5): 149 (2018).**IF=2.143.**
9. Libo Zhang, **ZakirUllah**, Yihan Sun, Tiejian Luo: A novel saliency detection method via manifold ranking and compactness prior. IEEE International Conference on Bioinformatics and Biomedicine (BIBM), 2016: 1628-1634.
10. Libo Zhang, YuanqiangCai, ZakirUllah, TiejianLuo:MLPF algorithm for tracking fast moving target against light interference. International Conference on Pattern Recognition (ICPR ), 2016: 3939-3944.
11. **ZakirUllah**, Zhiguo Wang, Mengqin Gao, Dan Zhang, Yiqi Zhang, Hong Gao, and Yanpeng Zhang, "Observation of the four wave mixing photonic band gap signal in electromagnetically induced grating", Opt. Express 22(24), 29544(2014).
12. Zhiguo Wang (supervisor), **ZakirUllah**, Mengqin Gao, Dan Zhang, Yiqi Zhang, Hong Gao and Yanpeng Zhang, "Analogy of transistor function with modulating photonic band gap in electromagnetically induced grating ", Scientific Reports volume 5, Article number: 13880 (2015). **.**
13. Zhiguo Wang, Mengqin Gao, **ZakirUllah**, Haixia Chen, Dan Zhang, Yiqi Zhang, and Yanpeng Zhang, "Optical processes in different types of photonic band gap structures", Opt. Materials 43, (2015).**IF= 2.687.**
14. Zhiguo Wang, Mengqin Gao, **ZakirUllah**, Dan Zhang, Haixia Chen, Hong Gao, and Yanpeng Zhang, "Interplay between six wave mixing photonic band gap signal and second-order nonlinear signal in electromagnetically induced grating," Opt. Express 23, 25098-25110 (2015). **IF=3.561.**
15. Dan Zhang, Zhiguo Wang, Mengqin Gao, **ZakirUllah**, Yiqi Zhang, Haixia Chen, and Yanpeng Zhang, "Observation of triple-dressing on photonic band gap of optically driven hot atoms," J. Opt. Soc. Am. B32, 1961-1967 (2015**). .**
16. Mengqin Gao, Zhiguo Wang, **ZakirUllah**, Haixia Chen, Dan Zhang, Yiqi Zhang, and Yanpeng Zhang, "Modulated photonic band gaps generated by high-order wave mixing," J. Opt. Soc. Am. B 32, 179-187 (2015)**..**
17. Zhenkun Wu, Yunzhe Zhang, **Zakir Ullah**, Tao Jiang, and Chenzhi Yuan, "Solitons of four-wave mixing in competing cubic-quintic nonlinearity," Vol. 23, Issue 7, pp. 8430-8440 (2015).

## Patents

- Chen Xiaopeng, **Zakir Ullah**, Huang Qiang, Xu Peng, Ma Siyan, Yu Mingming, Zhao Peiyuan , "An unknown maze traversal technique based on detecting and following the closest to the final-target and unvisited gap", 2021, 202111462554.X.
- Chen Xiaopeng，WangQihang，ZakirUllah，ZhaoPeiyuan, Yu Mingming, Xu Peng, Huang Qiang，"基于拓扑图的覆盖路径规划方法和装置", 2022, 2022110712596.

## Languages

English, Chinese, Urdu, Arabic(reading, writing)