

Ahmad Kamal Nasir

Assistant Professor of Electrical Engineering
CO-PI of National Agriculture Robotics Lab
Director Engineering Laboratory
LUMS School of Science and Engineering Lahore, Pakistan

BIOGRAPHY

DATE OF BIRTH: 29th September 1982 **SEX:** Male **MARITAL STATUS:** Married **NATIONALITY:** Pakistan
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CURRENT ADDRESS: LUMS SSE, Sector U, DHA, Lahore Cantt, 54792, Pakistan
PERMANENT ADDRESS: House # 209/Z Housing Colony Nankana Sahib, Pakistan
URL: <http://web.lums.edu.pk/~akn/>

RESEARCH GOALS

Apply solutions from multiple disciplines to solve real world crop monitoring related problems in agriculture.

RESEARCH AREAS

Mobile Robotics, Computer Vision, Remote Sensing, Embedded and Control Systems

EDUCATION

PHD IN MOBILE ROBOTICS, UNIVERSITY OF SIEGEN, GERMANY	2014
Dissertation topic: Cooperative Simultaneous Localization and Mapping	
MASTERS IN MECHATRONICS ENGINEERING, UNIVERSITY OF SIEGEN, GERMANY	2009
Master thesis: Modeling, Fabrication and Control System Design of Autonomous Helicopter	
MASTERS IN MECHATRONICS ENGINEERING, UET LAHORE, PAKISTAN	2007
Master thesis: Design of Digital Electronic Stethoscope	
BACHELOR IN MECHANICAL ENGINEERING, UET LAHORE, PAKISTAN	2004
Bachelor thesis: Design and Fabrication of a 3-Axis CNC PCB Drilling Machine	

ACADEMIC EXPERIENCE

ASSISTANT PROFESSOR OF ELECTRICAL ENGINEERING LUMS School of Science and Engineering, Pakistan	March 2014-Present
RESEARCH ASSISTANT University of Siegen, Germany	April 2008 – September 2013
VISITING LECTURE OF COMPUTER SCIENCE AND ENGINEERING DEPARTMENT UET Lahore, Pakistan	March 2004-September 2005
MANAGER MECHATRONICS LABORATORY, RESEARCH CENTER UET Lahore, Pakistan	March 2004-September 2005

VISITING POSITION

VISITING RESEARCHER	May-June 2016
Department Elektrotechnik und Informatik Lehrstuhl für Regelungs- und Steuerungstechnik (RST), University of Siegen, Germany	July-August 2017
	July-August 2018

INDUSTRIAL EXPERIENCE

PRODUCT DEVELOPMENT MANAGER	September 2005 - September 2007
MicroTech Industries (MTI) Private Limited Lahore, Pakistan	
ENGINEERING APPRENTICESHIP	June 2002 – July 2002
Japan Power Generation(JPG) Private Limited Lahore, Pakistan	May 2001 – August 2001

RESEARCH FUNDING AWARDS

PRECISION AGRICULTURE: TALKING FIELDS – MULTI MODAL SPATIAL TEMPORAL CROP CLASSIFICATION AND AREA ESTIMATION SYSTEM, 2019-20	EUR 80,000
DAAD Research Cooperation Grant between LUMS - Uni Siegen, (PI: Prof. Dr. –Ing. Hubert Roth, Dr. –Ing. Ahmad Kamal Nasir, Co-PI: Dr. Aamir Shahzad, Dr. Maria Anjum)	
NATIONAL AGRICULTURE ROBOTICS LAB, 2018	US\$ 1000,000
Higher Education Commission Pakistan (HEC), (PI: Dr. Abubakr Muhammad, Co-PI: Prof. Dr. Mian Muhammad Awais, Dr. –Ing. Ahmad Kamal Nasir, Dr. Murtaza Taj)	
DEVELOPMENT OF A LONG ENDURANCE HYBRID UAV FOR AGRICULTURAL AND FORESTRY APPLICATIONS, 2017	US\$ 10,000
LUMS Faculty Initiative Fund (FIF), (PI: Dr. –Ing. Ahmad Kamal Nasir, Co-PI: Prof. Dr. Mian Muhammad Awais)	
ESTIMATING WATER STRESS INDEX FOR PRECISION AGRICULTURE APPLICATIONS USING A THERMAL CAMERA, 2016	US\$ 5,000
LUMS Center for Water Informatics and Technology (WIT), (PI: Dr. –Ing. Ahmad Kamal Nasir)	
DEVELOPMENT OF A LOW COST HIGH RESOLUTION AERIAL MAPPING SYSTEM FOR CARBON SEQUESTRATION: POTENTIAL OF TREES IN AND AROUND LAHORE CITY, 2016	US\$ 10,000
LUMS Faculty Initiative Fund (FIF), (PI: Dr. –Ing. Ahmad Kamal Nasir, Co-PI: Prof. Dr. Mian Muhammad Awais)	
PRECISION FORESTRY: GREENDRONE -DEFORESTATION AND FOREST DEGRADATION ESTIMATION USING AN UNMANNED AERIAL VEHICLE, 2016-17	EUR 80,000
DAAD Research Cooperation Grant between LUMS - Uni Siegen, (PI: Prof. Dr. –Ing. Hubert Roth, Dr. –Ing. Ahmad Kamal Nasir, Co-PI: Prof. Dr. Mian Muhammad Awais)	
AUTONOMOUS CONTROL OF UNMANNED GROUND VEHICLE (MARWA), 2014-15	US\$ 1000
National Grassroots ICT Research Initiative of Pakistan, (Supervisor: Dr. –Ing. Ahmad Kamal Nasir)	
EMBEDDED 6 DOF VISUAL-INERTIAL ODOMETRY FOR AERIAL AND GROUND ROBOTS, 2014-15	US\$ 5000
Higher Education Commission of Pakistan, (PI: Dr. –Ing. Ahmad Kamal Nasir, Co-PI: Prof. Dr. Abubakr Muhammad)	

TEACHING EXPERIENCE

EE565, Mobile Robotics	LUMS, SSE, Spring 2019
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EE100, Engineering Workshop (4 Sections)	LUMS, SSE, Spring 2019
EE100, Engineering Workshop (4 Sections)	LUMS, SSE, Fall 2018
EE100, Engineering Workshop (4 Sections)	LUMS, SSE, Spring 2018
EE565/CS5313, Mobile Robotics	LUMS, SSE, Spring 2018
EE565/CS5313, Mobile Robotics	LUMS, SSE, Spring 2017
EE100, Engineering Workshop (4 Sections)	LUMS, SSE, Spring 2017
EE100, Engineering Laboratory (4 Sections)	LUMS, SSE, Fall 2016
EE100, Engineering Laboratory (4 Sections)	LUMS, SSE, Spring 2016
EE565/CS5313, Mobile Robotics	LUMS, SSE, Spring 2016
EE100, Engineering Laboratory (4 Sections)	LUMS, SSE, Fall 2015
EE100, Engineering Laboratory	LUMS, SSE, Summer 2015
EE565/CS5313, Mobile Robotics	LUMS, SSE, Spring 2015
EE100, Engineering Laboratory (4 Sections)	LUMS, SSE, Spring 2015
EE100, Engineering Laboratory (4 Sections)	LUMS, SSE, Fall 2014
Machine Design and Mechanics of Materials (4 Sections)	UET Lahore, CSE, Fall 2004
Machine Design and Mechanics of Materials (4 Sections)	UET Lahore, CSE, Spring 2004
AutoCAD (4 Sections)	UET Lahore, CSE, Spring 2004

PROFESSIONAL COURSES

WORKSHOP ON CASE-BASED LEARNING (JAN 14-18 2019)

BY SCHOOL OF BUSINESS, LUMS, PAKISTAN

TRAINING ON EARTH OBSERVATION APPLICATION IN AGRICULTURE AND FOOD SECURITY (DEC 26-29 2018)

BY NATIONAL AGRICULTURE RESEARCH COUNCIL, ISLAMABAD, PAKISTAN

ENTREPRENEURSHIP DEVELOPMENT PROGRAM

By Center for Entrepreneurship at Business School , LUMS, Pakistan

GRANT WRITING WORKSHOP

By Dr. Jim Hill, Professor Emeritus at UC Davis, USA

EFFECTIVE TEACHING TRAINING

By Dr. Qaisar Sultana, Professor Emeritus at ECU, USA

INTER-CULTURAL COMMUNICATION AND COOPERATION

University of Siegen, Germany

STRESS MANAGEMENT WORKSHOP

MicroTech Industries Private Limited Lahore, Pakistan

C++ AND AUTOCAD 2000 TRAINING

UET Lahore, Pakistan

BOOKS CHAPTER

1. M. Ahsan Latif, Usman Akram, Ahmad Kamal Nasir. Understanding Color Images, In; Digital Image Processing. University of Agricultural Faisalabad Publisher, 2016.
(<http://onlinebooks.uaf.edu.pk/BookDetails.aspx?BookId=3>)
2. M. Jehanzeb M. Cheema, Hafiz S. Mahmood, M. Ahsan Latif, Ahmad Kamal Nasir. Precision Agriculture and ICT. University of Agricultural Faisalabad Publisher, 2016. (In Publishing)

JOURNAL PUBLICATIONS

1. A. K. Nasir, M. M. Awais, Hubert Roth, Nasser Gyaganda, "Tree detection and counting in 3d point clouds", IEEE Transactions on Geoscience and Remote sensing , 2017 (Submitted)

PEER-REVIEWED CONFERENCE PUBLICATIONS

1. Ahmad Kamal Nasir, Mohbat Tharani, 2017. Use of GreenDrone UAS System for Maize Crop Monitoring. The International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences.
2. Ahmad Kamal Nasir, Murtaza Taj, M. Fakhir Khan. Evaluation of Microsoft Kinect for Plant Health Monitoring. 5th IFAC Conference on Sensing, Control and Automation for Agriculture, 14-17 August 2016 Washington, USA.
3. Omair Hassaan, Ahmad Kamal Nasir, M. Fakhir Khan. Precision Forestry: Trees Counting in Urban Areas using an Unmanned Aerial Vehicle (UAV). 5th IFAC Conference on Sensing, Control and Automation for Agriculture, 14-17 August 2016 Washington, USA.
4. Ahmad Kamal Nasir, Christof Hille, Hubert Roth. A Navigation Application Using Inexpensive Android Based Devices for Humans and Mobile Robots. 19th IFAC World Congress held in Cape Town, South Africa, 24-29 August 2014.
5. Christof Hille, Ahmad Kamal Nasir, Hubert Roth. Development of an Outdoor Mobile Robot for Teleoperation As An Agent For A Robot Network. 19th IFAC World Congress to be held in Cape Town, South Africa, 24-29 August 2014.
6. Ahmad Kamal Nasir, Aiman Hsino, Hubert Roth, Klaus Hartmann. Aerial Robot Localization Using Ground Robot Tracking towards Cooperative SLAM. 19th IFAC Conference on Automatic Control in Aerospace, September 2-6 2013 Würzburg, Germany.
7. Cheng Chen, Wennan Chai, Ahmad Kamal Nasir, Hubert Roth. Low Cost IMU Based Indoor Mobile Robot Navigation with the Assist of Odometry and Wi-fi Using Dynamic Constraints. IEEE Position Location and Navigation Symposium, 2012, Myrtle Beach, South Carolina, USA.
8. Ahmad Kamal Nasir, Christof Hille, Hubert Roth. Plane Extraction and Map Building Using a Kinect Equipped Mobile Robot. Workshop on Robot Motion Planning: Online, Reactive, and in Real-time, IEEE/RSJ International Conference on Intelligent Robots and Systems, IROS 2012, Vilamoura, Algarve, Portugal, October 7-12 2012.
9. Ahmad Kamal Nasir, Christof Hille, Hubert Roth. Data Fusion of Stereo Vision and Gyroscope for Estimation of Indoor Mobile Robot Orientation. 1st IFAC Conference on Embedded Systems, Computational Intelligence and Telematics in Control, 2012 Würzburg, Germany.
10. Ahmad Kamal Nasir, Aiman Hsino, Klaus Hartmann, Cheng Chen, Hubert Roth. Heterogeneous Capability Multi-Robots Cooperative Framework. 1st IFAC Conference on Embedded Systems, Computational Intelligence and Telematics in Control, 2012 Würzburg, Germany.
11. Ahmad Kamal Nasir, Hubert Roth. Pose Estimation by Multisensor Data Fusion of Wheel encoders, Gyroscope, Accelerometer and Electronic Compass. 1st IFAC Conference on Embedded Systems, Computational Intelligence and Telematics in Control, 2012 Würzburg, Germany.

PRESENTATIONS/GUEST LECTURES

Invited talk on “Agricultural Remote Sensing” at 14 th Workshop on Field and Assistive Robotics, Dagstuhl, Germany.	19 th -20 th July 2018
Guest Lecture on Graph SLAM at University of Siegen, Germany	17 th July 2018
Presentation on “Trees detection and counting in 3D points cloud” at two days workshop on Precision Forestry at Pakistan Forestry Institute, Peshawar.	6 th -7 th December 2017
Presentation on “Application of UAV(s) for site-specific farming in Pakistan” at GCRF Food Security, Safety and Sustainability: Exploiting Synergies to optimize Impact HUB - Partnership Workshop at, SSE, LUMS, Pakistan. The workshop was organized jointly by Punjab Government, PARB, Swansea University and LUMS.	October 2017
Invited talk on “Site-Specific Agriculture and Forestry” at 3 rd International Workshop on Precision Agriculture and Forestry at Ali Institute of Education, Lahore, Pakistan.	October 2017

Invited Lecture on “Current Status and Technological Challenges of Precision Agriculture In Pakistan” at Executive Certificate in Agri-Business Management at REDC, LUMS, Pakistan	August 2017
Presentation on “Trees detection and counting in 3D points cloud” at one day workshop on Precision Forestry organized by University of Siegen, Germany	August 2017
Guest Lecture on Graph SLAM at University of Siegen, Germany	July 2017
Presentation on “The Future of Farming: Site Specific Agriculture” at one day seminar on Achievements, Initiatives and Modern Technology organized by Directorate of Agriculture Information Punjab and Mir Khalil-ur-Rehman Memorial Society(Jang Group of Newspapers), Pearl Continental Hotel, Lahore, Pakistan	June 2017
Lecture on current challenges in mobile robotics at Workshop on Robotics and E-Agriculture, LCWU, Lahore, Pakistan	October 2016
Invited Talk on Robotics @ LUMS at IEEE-Day at LUMS, Pakistan	October 2016
5th IFAC Conference on Sensing, Control and Automation for Agriculture, Seattle, USA	August 2016
Guest Lecture on Online and Full SLAM at University of Siegen, Germany	June 2016
Invited Talk on “GreenDrone: Application of UAV in precision agriculture and forestry” at UAF, Faisalabad, Pakistan	April 2016
Invited Talk on Precision Forestry at IEEE-Day at LUMS, Pakistan	October 2015
Guest Lecture on Manipulator Inverse Kinematics at LUMS, Pakistan	September 2015
Guest Lectures on Extended Kalman Filter based SLAM algorithms at LUMS, Pakistan	April 2014
Guest Lectures on Cooperative SLAM at University of Siegen, Germany	October 2013
IFAC Conference On Automatic Control in Aerospace, Germany	September 2013
IEEE/RSJ International Conference on Intelligent Robots and Systems, Portugal	October 2012
IFAC Conference on Embedded Systems, Computational Intelligence and Telematics in Control, Germany	April 2012

GRADUATE/UNDERGRADUATE SUPERVISION EXPERIENCE

BS(EE): Fully Autonomous VTOL UAV System	LUMS, Fall 2018-19
BS(EE): Performance Analysis Using EMG and Video Data	LUMS, Fall 2017-18
BS(CS): Inertial Visual Odometry	LUMS, Fall 2016-17
BS(EE): Design and Development of an Agricultural Robot for Autonomous Navigation	LUMS, Fall 2016-17
MS(CS) Thesis: SLAM for Precision Forestry ,Omair Hassan	LUMS, Fall 2015-16
BS(EE) SProj: Automatic forest trees counting	LUMS, Fall 2015-16
MS(MECT) Thesis: Development of a New Variable Stiffness Actuator Exploiting Adjustable Lever Arm Ratio, Muhammad Usman (2012-MC-1)	UET, Fall 2015-16
LUMS Teams for National Engineering Robotics Competition 2015	LUMS, Summer 2015
MS(EE) Thesis: Inertial Visual Sensor Data Fusion, Qazi Hamza Jan	LUMS, 2014-15
BS(EE) SProj: Autonomous Lawn Mower	LUMS, 2014-15
BS(EE) SProj: Autonomous Control of UGV Marwa	LUMS, 2014-15
BS(EE) SProj: Robotic Calligraphy	LUMS, 2014-15
Research Project: Quadrotor Control system design	LUMS, 2014-15

COMMUNICATION SKILLS

Mother tongue(s)	Urdu	UNDERSTANDING		SPEAKING		WRITING
Other language(s)		Listening	Reading	Spoken interaction	Spoken production	
English	PROFICIENT	PROFICIENT	PROFICIENT	PROFICIENT	PROFICIENT	PROFICIENT
			TOEFL			

German	GOOD	GOOD	GOOD A1, A2, B1	GOOD	GOOD
Spanish	BASIC	BASIC	BASIC	BASIC	BASIC

PROFESSIONAL SERVICE

SUMMER INTERNSHIP – MAKING QUADROTORS FOR NERC 2018	June-July 2018
MOBILE ROBOTICS TUTORIAL AT UAV-G 2017 BONN GERMANY: BUILDING AND CONTROLLING ROBOT USING V-REP AND ROS	September 2017
SUMMER INTERNSHIP – MAKING ROBOTS FOR NERC 2017	June-July 2017
FOUR DAYS UNIVERSITY STUDENTS TRAINING WORKSHOP - PROGRAMMING YOUR FIRST MOBILE ROBOT	19-22 December 2016
COMPLETE DAY MOBILE ROBOT BUILDING TUTORIAL FOR UNIVERSITY STUDENTS	14 October 2016
SUMMER INTERNSHIP – MAKING ROBOTS FOR NERC 2016	June – August 2016
SUMMER INTERNSHIP – MOBILE ROBOTICS CRASH COURSE	June - August 2015
LEGO ROBOTICS INTERNSHIP FOR HIGH SCHOOLS	15-26 August 2015

PROFESSIONAL AFFILIATION

REGISTERED ENGINEER WITH PAKISTAN ENGINEERING COUNCIL: MECH/28746
IEEE ROBOTICS AND AUTOMATION SOCIETY
WIT, CVLAB, RICE LABS, LUMS SSE

ORGANIZATIONAL/MANAGERIAL/COMPUTER SKILLS

Responsible for R&D activities, project planning, execution and team lead at MTI Pvt. Ltd. Pakistan.
C, C++, C#, Java, Matlab, Labview, **ROS**, V-REP and Maple.

AWARDS AND HONORS

Stage Secretary and Organizing committee member of 4th International Workshop on Precision Agriculture and Forestry at LUMS, Pakistan (12th Oct 2018).
<http://web.lums.edu.pk/~akn/Events/Workshops/WPAF2018.htm>

Technical Program Committee member for International Conference On Latest trends in Electrical Engineering & Computing Technologies (INTELLECT 2017), Karachi, Pakistan (15th-16th November 2017).
<http://intellect.pafkiet.edu.pk/committees.html>

Organizer of “RoboMela 2017” at Ali Institute of Education, Lahore, Pakistan. The three days event consist of jointly organized workshops; Workshop on Field and Assistive Robotics, 3rd International Workshop on Precision Agriculture and Forestry, 2nd International Workshop on Robotics and E-Agriculture, robotics for kids, project and poster competition and robotics tutorials for students. (12th-14th October 2017)
<http://robomela.org/>
<http://web.lums.edu.pk/~akn/Events/Workshops/WPAF.htm>

“GreenDrone” project is selected as one of the top five position during HEC’s fifteen years of excellence regional showcasing event held at LUMS in collaboration with HEC. Eighteen Universities participated in the event (27th September 2017)
<https://lums.edu.pk/news/general-news/lums-hosts-regional-research-products-showcasing-event-celebrate-15-years-hec>

Session Chair for Vegetation Monitoring and Agriculture at International Conference On Unmanned Aerial Vehicles in Geomatics, Bonn Germany (September 04th - 07th 2017).
http://uavg17.ipb.uni-bonn.de/?page_id=583#session4

Organizing committee member for the one day workshop on Precision Forestry organized by University of Siegen, Germany. (8th August 2017) <http://web.lums.edu.pk/~akn/Events/Workshops/WPF.htm>

Organizing committee member for one day “Workshop on Robotics and E-Agriculture (WREA)” organized by Lahore College Women University, Pakistan. (14th October 2016) <http://www.wrea.pk/program2.php>

Conference Secretary and Organizer for 2nd one day International Workshop “Robotics in Precision Agriculture (RIPA)” at LUMS Lahore, Pakistan (13th October 2016), <https://ripa.lums.edu.pk/>

Lead winning team, National Aerial Robot Competition “Game of Drones” held at College of Electrical and Mechanical Engineering, National University of Science and Technology, Rawalpindi, Pakistan (Aug 2016).

Established first bio-mechanics lab equipped with 20 high speed VICON motion and 4 high speed cameras in Pakistan at LUMS in cooperation with Pakistan Cricket Board (April 2016)

Research proposals reviewer for LUMS Faculty Initiative Fund (FIF Fall 2016, 2017)

Conference Secretary and Organizer for one day International Workshop “AI-Robotics in Precision Agriculture and Forestry (AIR-AGFO)” at LUMS Lahore, Pakistan (29th October 2015), <http://web.lums.edu.pk/~airagfo/>

Reviewer and workshop tutorials organizer for 9th International Field and Assistive Robotics Workshop, Lahore, Pakistan. (October 2015)

Chief guest at LGS Defense Lahore, Pakistan for MATCH (Mechatronics, Aerospace, Technology & Calculation Hub) 2.0 science event (September 2015)

<http://web.lums.edu.pk/~akn/Events/Miscellaneous/Chief%20Guest%20at%20LGS%20Match%202.htm>

Reviewer for 7th International Field and Assistive Robotics Workshop, Lahore, Pakistan (17th-18th October 2014)

Co-Chaired a invited session, Robotics Vehicles, of IFAC conference on "Embedded Systems, Computational Intelligence and Telematics in Control" (April 2012)

Article, “ Roboter erkunden ihre Umgebung“, published in “Studieren in Deutschland” (April 2012)

HEC Scholarship holder for Masters Leading to PhD (September 2007)

Second Position winner in ABU Robocon 2003 Bangkok Robotics competition at National level

First position in Higher Secondary School at Sub-District level (1999)

REFERENCES

Prof. Dr. –Ing. Hubert Roth, Universität Siegen, Fakultät IV Naturwissenschaftlich-Technische Fakultät
Department Elektrotechnik und Informatik , Lehrstuhl für Regelungs- und Steuerungstechnik (RST)
Hölderlinstr. 3 , 57068 Siegen, Germany [**PHD SUPERVISOR**]

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Prof. Dr. rer. nat. Klaus Schilling, Informatics building, room B201, Julius-Maximilians-University Würzburg, Am
Hubland, D-97074 Würzburg, Germany [**PHD SECOND SUPERVISOR**]

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Dr. Samsoun Inayat, Postdoctoral Fellow, Neurobiology Department, Northwestern University, Evanston,
Illinois, USA [**FORMER COLLEAGUE**]

SI@U.NORTHWESTERN.EDU

Dr. Ali Raza, Assistant Professor, Mechatronics & Control Department, University of Engineering and
Technology Lahore, 54890, Pakistan [**FORMER COLLEAGUE**]

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Dr. Abubakr Muhammad, Assistant Professor, Department of Electrical Engineering, School of Science and
Engineering LUMS, Sector U, DHA, Lahore Cantt, 54792, Pakistan, [**COLLEAGUE**]

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