ATIF ANWER

PhD Candidate

LITIS, INSA Rouen & CISIR, UTP Malaysia
(Dual-degree)

An experienced, enthusiastic and motivated researcher/engineer, with 12+ years of industrial experience (engineering R&D, Project management) prior to PhD.

Research background in computer vision, deep learning, 3D sensing and extensive experience in robotics, CAD, prototyping and mechatronics design.

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EDUCATION:

PhD ELECTRICAL & ELECTRONIC ENGINEERING
Jan 2019 - Present

INSA Rouen, France & CISIR, UTP Malaysia (Cotutelle)

Thesis: Specular Highlight Detection and Adversarial Generation of Specularity-Free Images using Multi-Domain Translation Network Trained with Polarimetric Data

MSc ELECTRICAL & ELECTRONIC ENGINEERING (BY RESEARCH)

Jan 2016 - Dec 2017

Universiti Teknologi PETRONAS (UTP), Malaysia

Thesis: Real-time underwater 3D scene reconstruction using Kinect v2 time of flight camera

B.E. MECHATRONICS
Jan 2001 - May 2004

National University of Sciences & Technology (NUST), Rawalpindi, Pakistan

College of Electrical & Mechanical Engineering

Thesis: Development and control of Bipedal Autonomous Robot (BART)

SELECTED PUBLICATIONS:

- **A. Anwer,** S. Ainouz, M. N. M. Saad, S. S. A. Ali, and F. Meriaudeau, "SpecSeg network for specular highlight detection and segmentation in real-world images," Sensors, vol. 22, no. 17, 2022, doi: 10.3390/s22176552.
- **A. Anwer,** S. Ainouz, N. M. Saad, S. S. A, Ali, and F. Mériaudeau, *"SHMGAN: Joint Network for Specular Highlight Detection and Adversarial Generation of Specular-Free Images from Polarimetric Data"* Neurocomputing, Aug 2022 (Submitted).
- **A. Anwer**, S. S. A. Ali, A. Khan and F. Mériaudeau, *"Underwater 3D Scene Reconstruction Using Kinect v2 sensor Based on Physical Models for Refraction and Time of Flight Correction",* IEEE Access, 2017

RESEARCH INTERESTS:

- Deep learning based Vision and perception, GANs, 3D Sensing
- Mobile Robotics & Mechatronics systems

SKILLS:

Frameworks and Languages:
Tensorflow, OpenCV, Python, MATLAB, C#

3D Modeling and Rendering:
PTC Creo, Sketchup, Blender

Design and Illustration:
Photoshop, Affinity Designer, Adobe XD, Corel Draw

Others:
Git, LaTeX, HTML, CSS

LANGUAGES:

Urdu	Native	● ● ● ● ●
English	Proficient	● ● ● ● ● IELTS Band 8.0
French	Beginner (A1)	● ○ ○ ○ ○

HOBBIES:

- Book reading
- Competitive PC gaming
- Graphics design & 3D modeling
- Aviculture, bird watching
- Cricket, Table tennis

WORK EXPERIENCE:

- **Design Consultancy / Freelance Projects**
  Dec '17 - Dec '20
  Consulting, design and developing various design and 3D modeling based projects
- **Humense**
  (Part-time/Project based)
  Nov '17 - Feb '18
  Developing smart solutions to unique problems related to Multi-Kinect 3D reconstruction for VR (Virtual Reality) application
- **Scifacterz (Startup venture)**
  Co-Founder & CTO
  2015-2016
  Robotics Startup venture centered on cutting edge projects in various domains including "NBE (Non Biological Entity)"; an open-source, low cost, research platform and Home Service Robot
- **Manager (Mechatronics)**
  2005 - 2016
  Various research positions in the industry with a combination of Mechanical, Electronics Design research and documentation responsibilities.

EXTRA CURRICULAR/PRO-BONO:

Lead Moderator:
2020 - present
r/ComputerVision subreddit and official Discord server

WCCFTECH.com
2010 - 2011
Hardware Reviewer / Blogger

Micronet Broadband Pvt Ltd.
Lead Server Administrator
2007 - 2012
Gaming-server & forum head-administrator

ACADEMIC EXPERIENCE:

- **Teaching - Full Semester Courses**
  Data Analysis and Digital Tools (Analyse des données / Outils numérique)
  INSA Rouen, France
  - *Feb - May 2022*
  - *Feb - April 2021*
- **Teaching Assistant**
  Universiti Teknologi PETRONAS, Perak Malaysia
  Teaching Assistant - Probability & Statistics
  (June-Nov 2019)
- **Lab Assistant**
  INSA Rouen
  Labs - MOOC (Soyez Acteurs du Web !) -
  (Nov 2021 -Feb 2022)

REFERENCES:

Samia Ainouz
Professor
Responsable de l'équipe Systèmes des Transports Intelligents
INSA Rouen Normandie - Laboratoire LITIS
Avenue de l'Université, 76801 Saint Etienne du Rouvray, Rouen, France
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Professor
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Syed Saad Azhar Ali
Assoc. Professor
Aerospace Engineering Department, King Fahd University of Petroleum & Minerals (KFUPM), Saudi Arabia
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CONTACT:

Google Scholar:
http://goo.gl/YLaLBP

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Research Gate:
researchgate.net/profile/Atif_Anwer

GitHub:
github.com/Atif-Anwer

Stack Overflow:
users/6799468/atif-anwer

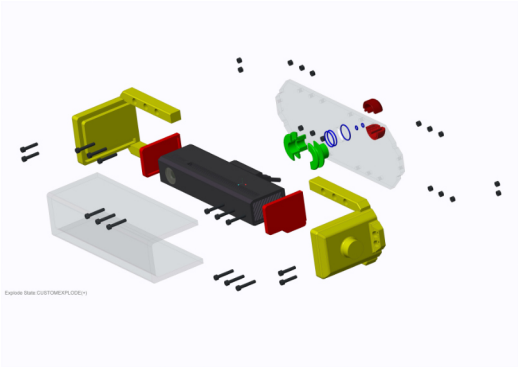
ACHIEVEMENTS:

- Graduate Assistant Scholarship, Universiti Teknology PETRONAS, Malaysia, 2016-2017 & 2019-2020.
- 1st round favourite for *"Robot Launch 2014"*, global robotics startup competition by RoboHub.org
- Winner of "*Intel More to the Core™ Challenge*", held in August 2011 by Intel™ Pakistan
- Winner of "*CPU IQ Blogger Challenge, South Asian region*", held in December 2010 by Intel™ Pakistan
- Member Technical Evalution & Judges panel, "*RoboSprint 2010*", Air University, Islamabad 2009
- Winner of "Best Idea Award" at the "*1st National FireFighting Robot Competition (FFRC)*" College of EME, NUST, September 2003.

MSC RESEARCH

- **UNDERWATER 3D SCENE RECONSTRUCTION USING RGB-D TIME OF FLIGHT CAMERA**

  The research successfully utilized Microsoft Kinect v2 for small-scale, near-real-time underwater object 3D scanning and scene reconstruction in a custom-designed waterproof housing. We successfully showed that underwater 3D scene reconstruction is possible using NIR depth cameras with acceptable accuracy and scanning distance trade-offs. Acquired depth data was processed to accommodate effects of refraction, sensor housing, change of imaging medium to water and removal of additional noise underwater without significant loss of features. The processed data was passed on to a custom implementation of Kinect Fusion for underwater 3D object scanning and model creation.



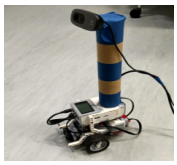
OTHER NOTABLE PROJECTS:

- **PORTABLE EEG HEADSET CAD DESIGN & PROTYPE WITH OpenBCI electrodes (2019)**

  The project was to design and prototype a novel foldable EEG headset for easy transportation. The design utilized OpenBCI electrodes and electronics for sensing. 3D printed design sucessfully delivered in 2019.

- **PERSON FOLLOWING ROBOT USING RGB CAMERA (2017):**

  The project implements real-me object localizaon, SIFT feature tracking, KLT, and PID control implemented on a Lego Mindstorm robot using MATLAB and a monocular camera setup. The robot successfully followed the person in an unstructured environment avoiding any obstacles that come in between.



PROJECT SUPERVISION:

- **DESIGN & FABRICATION OF AN AUTONOMOUS ALL TERRAIN SHRIMP ROVER WITH SURVEILLANCE & AUTONOMOUS NAVIGATION**

  Center of Advanced Studies in Engineering (C@SE), Islamabad, Pakistan (2011-2012)

  The 4th year final project was successfully completed by Undergraduate Students of Electrical Engineering in 2010. The robot was a GPS guided Semi-autonomous all-terrain vehicle, inspired from the design of Shrimp Rover. Website (https://sites.google.com/site/ayaanrover/)

- **MODELLING & CONTROL OF A 6-D0F ROBOTIC ARM FOR INDUSTRIAL APPLICATIONS (2011):**

  Mohammad Ali Jinnah University, Islamabad, Pakistan (2010 - 2011)

  The 4th year final project was a 6-DOF roboc manipulator for industrial applicaons. Manipulator was designed manufactured locally and forward & inverse kinemac control algorithms were implemented through an industrial grade embedded controller (C8051F06x) interfaced with an HMI Device, AVR µC based servo control.

COURSES & CERTIFICATIONS:

INSA Rouen

- Français Langue Étrangère - 2022

Pyimagesearch.com

- Deep Learning for Computer Vision with Python - *2019-2020*
- Practical Python and OpenCV - *June 2017*

Queens University of Technology (MOOC)

- Robotic Vision - October 2016

Muhammad Ali Jinnah University (MAJU), Islamabad

- Advanced Digital Image Processing - Fall 2012
- Computer Vision - Spring 2011
- Nonlinear Control Systems - Spring 2010
- Robust Control System - Spring 2010
- Pattern Recognition - Fall 2010

ALL PUBLICATIONS:

[1] **A. Anwer,** S. Ainouz, M. N. M. Saad, S. S. A. Ali, and F. Meriaudeau, "SpecSeg network for specular highlight detection and segmentation in real-world images," Sensors, vol. 22, no. 17, 2022, doi: 10.3390/s22176552.

[2] **A. Anwer,** S. Ainouz, N. M. Saad, S. S. A, Ali, and F. Mériaudeau, "SHMGAN: Joint Network for Specular Highlight Detection and Adversarial Generation of Specular-Free Images from Polarimetric Data" Neurocomputing, Aug 2022 (Submitted).

[3] A. Khan, S. S. A. Ali, **A. Anwer,** S. H. Adil, and F. Mériaudeau, "Subsea pipeline corrosion estimation by restoring and enhancing degraded underwater images," IEEE Access, vol. 6, pp. 40585–40601, 2018.

[4] **A. Anwer,** F. Mériaudeau, and S. H. Adil, "Customized graphical user interface implementation of Kinect Fusion for underwater application," in 2017 IEEE 7th international conference on underwater system technology: Theory and applications (USYS), 2017, pp. 1–6. doi: 10.1109/USYS.2017.8309445.

[5] **A. Anwer,** S. S. A. Ali, A. Khan, and F. Meriaudeau, "Underwater 3D scene reconstruction using kinect v2 based on physical models for refraction and time of flight correction," IEEE Access, vol. 5, pp. 15960–15970, 2017.

[6] **A. Anwer**, S. S. A. Ali, A. Khan, and F. Meriaudeau, "Underwater 3D scanning using Kinect v2 time of flight camera," in Quality control by artificial vision 2017 (QCAV '17), thirteenth international conference on, 2017, vol. 10338.

[7] D. McIntyre, W. Naeem, S. S. A. Ali, and **A. Anwer**, "Underwater surveying and mapping using rotational potential fields for multiple autonomous vehicles," in 2016 IEEE international conference on underwater system technology: Theory and applications (USYS), 2016, pp. 77–82. doi: 10.1109/USYS.2016.7893926.

[8] A. Khan, S. S. A. Ali, A. S. Malik, **A. Anwer,** and F. Meriaudeau, "Underwater image enhancement by wavelet based fusion," in 2016 IEEE international conference on underwater system technology: Theory and applications (USYS), 2016, pp. 83–88. doi: 10.1109/USYS.2016.7893927.

[9] A. Khan, S. S. A. Ali, A. S. Malik, **A. Anwer,** N. A. A. Hussain, and F. Meriaudeau, "Control of autonomous underwater vehicle based on visual feedback for pipeline inspection," in 2016 2nd IEEE international symposium on robotics and manufacturing automation (ROMA), 2016, pp. 1–5.

[10] **A. Anwer,** S. S. A. Ali, and F. Mériaudeau, "Underwater online 3D mapping and scene reconstruction using low cost kinect RGB-D sensor," in 2016 6th international conference on intelligent and advanced systems (ICIAS), 2016, pp. 1–6. doi: 10.1109/ICIAS.2016.7824132.

[11] **A. Anwer**, S. S. A. Ali, A. Khan, and F. Mériaudeau, "Real-time underwater 3D scene reconstruction using commercial depth sensor," in 2016 IEEE international conference on underwater system technology: Theory and applications (USYS), 2016, pp. 67–70. doi: 10.1109/USYS.2016.7893935.

[12] **A. Anwer,** A. Baig, and R. Nawaz, "Calculating real world object dimensions from Kinect RGB-D image using dynamic resolution," in 2015 12th international bhurban conference on applied sciences and technology (IBCAST), 2015, pp. 198–203. doi: 10.1109/IBCAST.2015.7058504.