

# Bilal Nazeer

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## WORK EXPERIENCE

### **Heriot-Watt University – Edinburgh, United Kingdom**

**City:** Edinburgh | **Country:** United Kingdom

**Link** <https://youtu.be/CuqXQ8l8qrs>

### **PhD in "Multiscale digital twin & AI driven smart robotic assembly system"**

[ 01/01/2024 – Current ]

My doctoral research in Robotics Engineering is part of the EPSRC initiative "A multiscale digital twin-driven smart manufacturing system for high value-added products." The project focuses on developing a flexible, fully automated multi-robot assembly system, driven and monitored in real time by a digital twin. My key areas include robotic system design for precision assembly, identifying key performance parameters, integrating feedback sensors, and developing the digital twin for process monitoring and control.

#### **Industry Projects:**

- **Automated Solar Cell Assembly (Chitendai):** Reduced assembly time by 50% for intricate solar cell panels through robotic automation.
- **Cube Satellite Automated Assembly (University of Strathclyde):** Demonstrated a fully autonomous assembly system capable of handling variable satellite components.
- **4SB Battery Swapping System:** Currently developing a flexible, closed-loop autonomous system for rapid EV battery replacement.

### **Defence Research and Development Organisation – Pune, India**

**City:** Pune | **Country:** India

### **R&D Intern at DRDO (Robotics division)**

[ 22/08/2022 – 21/05/2023 ]

Worked with the Defence Research and Development Organisation (DRDO) on the design, dynamic simulation, and inverse kinematics of a manipulator arm for combat support systems. Built a realistic simulation environment and control interface using ROS2 packages and developed a hybrid kinematics algorithm to optimize arm movements and enhance operational efficiency. Contributed to the integration plan to ensure seamless adoption within DRDO's existing combat support systems.

### **Government of India**

**Link** <https://drive.google.com/file/d/1NFn172SAMVO2rnYusaQW3T6zTAcGn5lO/view?usp=sharing>

### **Project Lead – Hybrid powertrain development for LMVs**

[ 31/03/2020 – 31/12/2024 ]

Directed a government-funded initiative to design a compact, modular hybrid powertrain capable of operating in both series and parallel modes.

Oversaw prototype development, IP filing, and early validation through lab simulations and test bench trials.

Collaborated with Ashok Leyland on vehicle simulations, achieving verified improvements in fuel efficiency with minimal changes to conventional ICE systems.

Secured industry collaboration with Drive System Design (DSD), and conducted a feasibility study based on the project's technical promise.

Guided the team through funding applications, industry outreach, and award submissions.

**Key Achievements:** Winner of the *NIC 2020 Award* with funding; recognised with the *Dare to Dream Award 2024*; Commendations from involved industries and project handover to Ashok Leyland, filed design patents supporting IP protection.

*I developed an interactive Windows-based executable to provide a brief demonstration and understanding of the technology, which can be downloaded from the URL above.*

## **Tech Raven, Zenios – Noida, India**

City: Noida | Country: India | Business or sector: Information and communication

Link <https://www.youtube.com/watch?v=ByrPgwJVtOI>

### **Extended Reality developer**

[ 28/12/2022 – 01/12/2023 ]

Led the development of an AR glasses based control interface and search tool. Integrated real-time image processing, computer vision, hand tracking, language processing, and AI for hands-free interaction. Designed and tested a functional prototype for information access and task execution, with ongoing development under NDA.



### **Software developer Roles**

[ 31/03/2016 – 28/12/2022 ]

#### **1. Full Stack Developer – Sanganan IT Solutions (2018 – 2022)**

- Led fullstack development of *Jive Bird*, a mobile app with immersive 3D environments and cloud-connected features. Released on both iOS and Android.

#### **2. Freelance Game Mechanics Programmer – Lexcorp India (2016 – 2017)**

- Worked on game mechanics and physics algorithms.

#### **3. Founder – DKAL Apps (2022 – 2023)**

- Founded and managed a studio developing apps and games across iOS, Android, and Windows. Delivered key projects such as *Project Destruction* (high-fidelity deformation engine).

#### **4. Lead Developer & Programmer – Blausm**

- Built both front-end and back-end of a mobile based social platform supporting autistic individuals and families.

#### **5. Product Showcase Designer (AR/VR)**

- Designed high-fidelity interactive product showcases in AR and non-AR formats for client demonstrations.

## **EDUCATION AND TRAINING**

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### **M .TECH DEFENCE TECHNOLOGY (COMBAT VEHICLES)**

**Amity University Noida** [ 2021 – 2023 ]

City: Noida | Country: India | Field(s) of study: Automobile Engineering, Powertrain | Final grade: 87%

### **B.TECH MECHANICAL ENGINEERING**

**Amity University Noida** [ 2016 – 2020 ]

City: Noida | Country: India

### **Certified Cloud computing associate and consultant from Oracle University**

Final grade: 85

Six month intensive training from Oracle University for cloud computing and data security and clear the certification test with above 80% score.

### **Artificial Intelligence & Machine learning**

**DIAT OTCC** [ 05/06/2023 – 30/11/2023 ]

Website: [https://www.drdo.gov.in/sites/default/files/whats\\_new\\_document/AlandML\\_BrochureB05.pdf](https://www.drdo.gov.in/sites/default/files/whats_new_document/AlandML_BrochureB05.pdf)

The training and certification course is a 12 weeks online course offering a mix between fundamentals and advanced topics of AI & ML such as Probability Theory, Pattern Recognition, Big Data Analytics, Computer Vision, Natural Language Processing, Augmented Reality, Deep Learning and related advancements in the domain. The syllabus is designed by leading academicians and AI experts from DRDO.

## PUBLICATIONS

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[2025]

**Experimental study of a novel contact-based pose detection approach for digital twin-driven high-precision micro assembly**

Link: <https://researchportal.hw.ac.uk/en/publications/experimental-study-of-a-novel-contact-based-pose-detection-approa>

[2024]

**Contact-based pose detection method for small components to optimise the digital twin-driven robotic assembly process**

Link: [https://www.matec-conferences.org/articles/matecconf/abs/2024/13/matecconf\\_icmr2024\\_13008/matecconf\\_icmr2024\\_13008.html](https://www.matec-conferences.org/articles/matecconf/abs/2024/13/matecconf_icmr2024_13008/matecconf_icmr2024_13008.html)

[2021]

**Patent - Regenerative Clutch In Light Motor Vehicles (201911027399)**

[2021]

**Patent - BICONTINUOUS VARIABLE TRANSMISSION (201911018743)**

[2017]

**Increasing Power Train Efficiency Using Regenerative Clutch System**

## ACIVEMENTS

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**Winner of NIC Innovation contest 2020 (Held by MHRD)**

Won the National Innovation Contest ( Solution Hackathon) 2020 held by MHRD India.

[ 2023 ]

**Winner of Ashok Leyland - 2023 Automobile Hackathon**

[ 2024 ]

**Winner of Dare to Dream contest 2024 (Held by DRDO)**

## LANGUAGE SKILLS

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**Mother tongue(s):** English | Hindi

**Other language(s):** Arabic

## SKILLS

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**Key Programming Languages**

C++ / C# / C / Kotlin / Java / Python