



# Amitoj BATTU

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## ABOUT ME

I'm an AI and Robotics developer actively seeking a role that promises both interesting challenges and a collaborative team. Following my recent graduation and current startup experience, I'm now looking to pursue professional environments that provide learning and growth, where I can use my programming experience and wide range of skills to create ideas, contribute meaningfully to project development life-cycles, and consistently deliver impactful, high-quality results.

## EDUCATION

### M.SC IN ARTIFICIAL INTELLIGENCE

UNIVERSITY OF GRONINGEN, NETHERLANDS

Aug '20 - Jun '23

### B.TECH IN MECHATRONICS ENGINEERING

MANIPAL UNIVERSITY JAIPUR, JAIPUR, INDIA

Aug '15 - Jul '19

## SKILLS

**PROGRAMMING LANGUAGES** Python | C++ | Embedded C | PLC Ladder Logic | KUKA Robot language

**FRAMEWORKS & LIBRARIES** Tensorflow | PyTorch | SKlearn | Keras | Numpy | ROS | Docker | RESTful API | Git | Autodesk  
AWS | Siemens S7-200 | Unreal Engine | RaspberryPi | MATLAB | OpenAIGym | Googling | KUKA |  $\LaTeX$

**LANGUAGES** English (Fluent) | Dutch (Beginner)

## EXPERIENCE

### OLIVE BRANCH GAMES (NETHERLANDS - REMOTE)

May '23 - Ongoing

#### AI ENGINEER

- I developed AI-driven solutions to enhance player experiences and gameplay in a remote-team environment.
- I further created and fine-tuned neural networks using Python (TensorFlow, PyTorch) for object recognition, enemy AI behaviour using RL, and player behavior analysis and prediction.
- Integrated these AI models with Unreal Engine through C++ to establish real-time communication and seamless interactions within the gameplay.
- Collaborated with designers, developers, and artists to align AI features with gameplay goals and iterate on improvements.
- Contributed actively to agile processes, code reviews, and brainstorming sessions, optimizing AI features and elevating the overall game experience.

### INTELLIGENT PROJECT SOLUTIONS (CANADA)

Feb '19 - Dec '20

As an Engineering intern, I worked with Piping and Instrument Diagrams (P&ID) for different chemical plants, understanding plans and annotating symbols for NN training using .DWG files or 3D models in AutoCAD Plant3D.

### KUKA ROBOTIC TRAINING CENTRE (AKGEC)

Jan - Jul, '19

A 6-month internship where I mastered setup, calibration, and programming of robotic arms for industrial applications. Further programmed these arms for various exercises and developed custom welding-gun program modules to achieve 3D metal printing.

## PROJECTS

### MASTER'S THESIS - HUMAN-ROBOT COMMUNICATION DURING OBJECT CO-TRANSPORTATION [🔗](#)

- Developed and trained custom neural networks on a self-developed dataset to recognize physical gestures for collaborative object carrying with TIAGo robot (by applying Time series classification).
- Implemented a Point-and-target method to indicate the desired location of the object simply by pointing to the location, which included camera image aligning to PointClouds, frame conversions, and image recognition.
- Programmed TIAGo robot using C++ and Python within a behavioral architecture, while communicating with AI models running in Docker via RESTful API and ROS Nodes.

### MACHINE LEARNING

#### • NLP Sentiment Analysis: Docker / AWS implementation: [🔗](#)

I created a specialized dataset from labeled text of previous competitions for training a BERT language model to perform sentiment analysis. The model was fine-tuned and deployed in a local Docker container with a RESTful API. For online hosting, I created a Flask application to host the sentiment analysis model on an EC2 instance using the Deep Learning Amazon Image.

#### • Spotify Recommendation System: Docker / AWS implementation:

I developed a comprehensive music recommendation system using Python, data analysis, and machine learning techniques to compare between Collaborative filtering and Content-based filtering, to analyze song audio features and genre attributes for meaningful insights. The model was then deployed on Docker and AWS to create an interactive recommendation engine based on user-listened songs input.

## • Deep learning & Reinforcement learning

- I programmed projects including Handwriting recognition on the Dead Sea scrolls, American Sign Language to text converter using OpenCV, and Irish folk music generation utilizing RNNs.
- Further created custom environments in Pygame, such as FlappyBird, to train agents using NEAT algorithm for reinforcement learning. Additionally, trained RL agents in environments including Lunar-Lander, Q-Learning frozen-lake, Deep Q-Learning for Atari games, A2C for robotic simulation in Pybullet, and conducted experiments with Policy Gradient using PyTorch.

## ROS & ROS2

- **Domestic Robot Butler:** Currently developing by leveraging ROS2 on Raspberry architecture for SLAM, object and voice recognition, enabling navigation to specific rooms in the house and autonomous retrieval and delivery of objects.
- **Pick & Place Robot:** Implemented SLAM on a 4W mecanum robot, utilizing the generated map for navigation to key locations for object grasping and dropping based on object recognition.
- **5 DOF Arm:** Designed and developed a custom 5 DOF robotic arm in Gazebo, creating URDF and MoveBase functionalities from scratch for precise pick and place operations.

## BACHELOR'S THESIS - METAL ADDITIVE MANUFACTURING

- Developed and implemented custom written algorithms to convert CAD models into Gcodes, enabling precise control for 3D printing metallic objects using a welding gun mounted on the KUKA robotic arm.

## EXTRAS

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### PUBLICATIONS

#### MEDICAL

- [DOI](#) [↗](#) Comparison of Incidence of Pre-Analytical phase errors in OPD and IPD samples in a super-specialty hospital: A Retrospective study.
- [DOI](#) [↗](#) Incidence of Pre-analytical Phase Errors: A Retrospective study in biochemistry lab of a tertiary care hospital.
- [DOI](#) [↗](#) Training - An important factor in reducing Pre-Analytical errors in Biochemistry lab of a tertiary care hospital.

### POSTS HELD

- **UNICEF Sub-committee Secretary:** 1 year volunteering work for the local chapter of UNICEF, organizing fund-raising events around Groningen, Netherlands.
- **Project Head/Coordinator for the Robotics Club (B.Tech):** Taught a team of 30+ students the basics of electrical and electronics while helping build projects using various controllers. Position also included organising and managing Technical events and seminars for the Robotics Club.
- **Program Committee member for IEEE (B.Tech):** Assisted in planning venues and organize Technical events held by local Chapter of IEEE.

### EXTRACURRICULAR COURSES

- (AKGEC) KUKA Robot Programming Basic Level
- (AKGEC) KUKA Robot Programming Advance Level
- (AKGEC) LabVIEW CORE III
- (AKGEC) Siemens NX-11 CAD/CAM
- ROS for Beginners I: Basics, Motion, OpenCV - [Udemy](#) [↗](#)
- ROS for Beginners II: Localization, Navigation and SLAM - [Udemy](#) [↗](#)
- ROS2 How To: Discover Next Generation ROS - [Udemy](#)
- Introduction to Computer Science and Programming Using Python - [edX](#) [↗](#)
- Introduction to Programming with MATLAB - [Coursera](#) [↗](#)
- Control of Mobile Robots - [Coursera](#) [↗](#)

### SMALLER PROJECTS

- **KUKA Robot arm palletizer:**  
Programmed a real-world KUKA arm to palletize cubes in various patterns while using keypad input to differentiate between cubes, orientation and target bins.
- **Microcontrollers and Microprocessors:**  
Developed various projects including a 5 DOF robotic arm, an RFID-based E-passport system, a PLC-based traffic density control, a biometric security system, the Theo Jansen walking mechanism, and an 11-segment, 6-digit display.
- **Generative Adversarial Network(GAN) development:**  
Completed projects used GAN and DCGAN architectures to train deep CNN models for generating handwritten MNIST digits, performed style transfer using cyclegan models, generated MNIST fashion dataset using autoencoder models, and trained WGAN models for generating Van Gogh paintings.