Amitoj Battu

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Education

MSc in Artificial Intelligence 2020 - Ongoing
University of Groningen, Netherlands

B.Tech in Mechatronics Engineering 2015 - 2019
Manipal University Jaipur, Jaipur, India

Secondary School - Scholar Fields Public School, Patiala (CBSE) 2013 - 2015

High School - Yadavindra Public School, Patiala (ICSE) 2003 - 2013

Internships

Intelligent Project Solutions: IPS-AI February 2019 - December 2020
Interning online as a core member of the startup, I worked on sets of Piping and Instrument Diagrams(P&ID) for different chemical plants. Understanding the diagrams, annotating the symbols and preparing lists of instruments and vessels through with .DWG files of plant sections or 3D models in AutoCAD Plant3D.

KUKA Robotics Training Centre - AKGEC January - July, 2019
A 6 month internship working on various robotic arms, learning how to setup, calibrate and master them for industries, programming them to perform various sets of instructions for different exercises. As the final project, custom modules were programmed for the arm to use a mounted welding gun for additive manufacturing.

Training and Observation

Observation : ESGI Tools Pvt Ltd 2018
One month Industrial Observation at the manufacturing plant to get an insight on how work is done in the factory and operations performed on different CNC machines.

Training 2016
Summer Training on Embedded Systems at Tata Consultancy Services - ION (Patiala) which included programming microcontrollers(AVR, Arduino, PIC) using embedded C and serial communication protocols to interface basic sensors.

Technical Skills

Languages - Python, C++, Embedded C, Ladder logic programming, KUKA Robot language.
Tools/Frameworks - Tensorflow, Pytorch, Sklearn, Flask, Keras, Numpy, ROS/Gazebo, Ultimaker Cura, Autodesk Eagle (PCB Designing), AutoCAD, Labcenter Proteus, SolidWorks, Autodesk Fusion 360 (Cad Modelling), Siemens S7-200 (PLC Programming), MATLAB, LabVIEW, Arduino, RaspberryPi, AVR microcontroller, KUKA, and LaTeX.

Publications

- 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 DOI

Projects

- **Deep Learning** - Handwriting recognition on the Dead Sea scrolls : Audio classifier using DeepCNN : Iris detection model : ASL to text converter : NLP twitter sentiment analysis : Music generation using RNN.
- **ROS** - Developed a robot to perform SLAM of it's environment in Gazebo to further navigate and grasp identified objects through object recognition : Robotic arm simulations to pick and place cubes : Custom modules to control omni-directional 'Moorebot Scout' over ROS.
- **GANs** - Deep CNN model to generate handwritten MNIST digits using GAN and DCGAN : CycleGAN model for style transfer : Autoencoder model to generate MNIST fashion dataset : WGAN implementation to generate Van Gogh paintings.
- **Reinforcement Learning** - Developed the custom environment (FlappyBird) to train an agent using Pygame, further implemented using NEAT algorithm : Lunar-Lander environment : Q-Learning frozen-lake environment : Deep Q-Learning for Atari games : Unity MLAgents : Policy gradient with PyTorch : A2C for Robotic Simulation in PyBullet.

- **Metal Additive Manufacturing** - Bachelor Thesis project - Using a custom written algorithm, converted CAD models into Gcodes, further Gcodes into KUKA robot language, and using the weld deposit of the welding gun mounted atop the arm, re-created the CAD model layer by layer, achieving 3D printing of metallic objects.
- **KUKA 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** : 5 DOF robotic arm : RFID based E-passport : PLC based traffic density control : Biometric security system : Theo Jansen walking mechanism : 11 Segment 6 digit display.

Posts Held

UNICEF Sub-committee Secretary - Volunteer work for the local chapter of UNICEF, organizing fundraising events around Groningen.
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.

Courses

Certified Courses

- KUKA Robot Programming Basic Level
- KUKA Robot Programming Advance Level
- LabVIEW CORE I&II
- Siemens NX-11 CAD/CAM

Online Courses

- ROS for Beginners: Basics, Motion, and OpenCV - Udemy - Udemy
- ROS2 How To: Discover Next Generation ROS - Udemy - Ongoing
- Introduction to Computer Science and Programming Using Python - edX
- Introduction to Programming with MATLAB - Coursera
- Control of Mobile Robots - Coursera

Interests

- Robotics, Automation, Artificial Intelligence, Generative Adversarial Networks (GANs), Re-inforcement learning, The Simpsons.