ABHISHEK BAMOTRA

abamotra@andrew.cmu.edu ♦ (412) 692 1807 ♦ linkedin.com/in/abamotra ♦ cv.abhib.com

EDUCATION

Carnegie Mellon University, Pittsburgh, PA **Dec 2020**
Master of Science in Computational Design and Manufacturing GPA **4.0/4.0**
♦*Intermediate Deep Learning** ♦*Robot Localization & Mapping** ♦*ML for Large Dataset* ♦ *Computer Vision* ♦*Deep RL & control*

Thapar Institute of Engineering & Technology, India **Jun 2019**
Bachelor of Engineering in Mechatronics Engineering GPA **9.09/10.0**
♦ *Robotics Engineering* ♦ *Industrial Automation* ♦ *Digital Signal Processing* ♦ *Machine Design*

WORK EXPERIENCE

Research Fellow, Computational Engineering and Robotics Laboratory, **CMU, Pittsburgh** **Jan 2020 – Present**
- ♦ *Developing machine learning algorithms for Point Cloud data.*
- ♦ *Object detection and warpage measuring using PCL.*
- ♦ *Developing algorithms to generate 3-D reconstruction using multi-light 2-D images.*

Course Assistant, Intro to Scientific Computing (24-281), **CMU, Pittsburgh** **Jan 2020 – May 2020**
- ♦ *Assisted with Homework, Quizzes, Projects and Tests.*

Robotics Intern, BioMechatronics Lab**, National University of Singapore, Singapore** **Feb 2018 - Jul 2018**
- ♦ *Hand-on experience with soft material fabrication.*
- ♦ *Designed robotic hand gripper and an ultra-sensitive tactile sensor using 3-D printing and soft material.*
- ♦ *Soft gripper could lift 200 times its own weight and sensor was sensitive to 0.5 mN force.*

Robotics Intern, Robotics Lab, **Universidad Carlos III de Madrid, Spain** **May 2017 - Jul 2017**
- ♦ *Hands-on experience with ROS, C++, and Linux.*
- ♦ *Programmed Arduino to control mini robots and automatic wireless communication between micro and mini robot*

SKILLS

Advanced: PTC Creo, C/C++, Python, MATLAB, Arduino, 3-D Printing
Intermediate: Spark, Festo Fluid SIM, RSLogix, AutoCAD, Solidworks, OpenGL, Keras, PyTorch, PCL
Basic: Java, NI Multisim, ROS, Keil, AWS

PROJECTS

New York City Taxi Fare Prediction (CMU) **Jan 2020 – May 2020**
- ♦ *Developed a pipeline for a large-scale dataset (~1Tb)*
- ♦ *Algorithms based on Linear Regression, Decision Tree, Random Forest and XGBoost*.

KeyDetect - Detection of anomalies and user based on Keystroke Dynamics (CMU) **Oct 2019 – Dec 2019**
- ♦ *Developed a 2-step authentication model to learn and verify the user based on the typing patterns.*
- ♦ *Algorithms based on SVM, Neural Networks (1-D Conv., with Negative Class), Decision Trees.*

Controller Design for an Autonomous Vehicle to track the route (CMU) **Oct 2019 – Dec 2019**
- ♦ *De-noised the input sensor data using Kalman Filter.*
- ♦ *Developed PID, Feedback, Optimal controller for the vehicle and bagged position in top 20 %.*

Spine Adjustable Smart Bed (Thapar Institute of Engineering & Technology) **Aug 2018 – Apr 2019**
- ♦ *Invented a prototype to show working of a novel real-time spinal adaptive smart bed.*
- ♦ *Integrated Inertial Measurement sensors, Infrared sensor, wireless control, Arduino.*

PATENTS & PUBLICATIONS

Kirigami-Inspired soft end-effector with layer jamming for stiffness control (Patent) **Under review**
***Abhishek Bamotra**, Pushpinder Walia, A.V. Prituja & H. Ren* Jun 2018

Tri-axial Force Sensor (Patent) **Under review**
*Pushpinder Walia, **Abhishek Bamotra** & H. Ren* Jun 2018

Layer-Jamming Suction Grippers with Variable Stiffness **ASME JMR**
***Abhishek Bamotra**, Pushpinder Walia, A.V. Prituja & H. Ren* **10.1115/1.4042630** Jan 2019

Fabrication and Characterization of Novel Soft Compliant Robotic End-Effectors with Negative Pressure and Mechanical Advantages **IEEE ICARM** Jul 2018
***Abhishek Bamotra**, Pushpinder Walia, A.V. Prituja & H. Ren* **10.1109/ICARM.2018.8610688**

Design and Fabrication of Soft-bodied 3-D Tactile Sensors with Magnetometers **IEEE ICIA**
*Pushpinder Walia, **Abhishek Bamotra**, A.V. Prituja & H. Ren* **10.1109/ICInfA.2018.8812448** Aug 2018

Active Contact Enhancements With Stretchable Soft Layers and Piezoresistive Tactile Array for Robotic Grippers **IEEE CASE** Aug 2019
*G. Ponraj, A.V. Prituja, **Abhishek Bamotra**, Zhu G., H. Ren, et al.* **10.1109/COASE.2019.8842882**