

# DIPAM PATEL

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**Interests:** Machine Learning, Robot Operating System, Computer Vision, Augmented Reality

## EDUCATION

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### Master of Engineering in Robotics

**Expected: December 2019**

University of Maryland, College Park, MD, USA

**Current GPA: 3.77**

**Relevant Courses:** *Perception and Planning for Autonomous Robots, Computer Vision, Control of Robotic Systems, Robot Learning, AI & Deep Learning Frameworks*

### Bachelor of Engineering in Mechanical

**June 2016**

Gujarat Technological University, Ahmedabad, India

**Cumulative GPA: 3.42**

## PROJECTS

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- Deep Q-Network based Lane Following Toy Car (*Ongoing*)  
Training a Robot Car in Simulation using Deep Q-Network to drive in its Lane and Transfer the learning on a Toy Car
- Emergency Vehicle Detection using Tensorflow Deep Learning API (Winner of Northrop Grumman Competition)  
Recognized and located vehicles from images/videos using the concepts of transfer learning and faster RCNN
- Lane Detection to mimic lane departure warning systems used in Self-driving cars  
Used the concepts of hough lines, region of interest and vanishing point, lanes were detected for real-world scenarios
- Traffic sign recognition involving Detection and Classification  
Taught a model in MATLAB to recognize traffic signs and tested it for the real-world scenarios
- Face and Eye Detection using Haar Cascade Classifiers in OpenCV  
Using the cascade function trained from positive and negative images to identify features of the human face
- Location based Augmented Reality Scavenger Hunt game (*Ongoing*)  
Developing an interactive AR game using the GPS+AR package in Unity
- Walking, Dancing and Obstacle avoidance toy robot 'Otto'  
Built a 3D printed toy robot using Arduino Nano and Servo motors that helped it move around and avoid obstacles
- 3D-printed wearable Smart Watch (*Ongoing*)  
OLED screen, bluetooth, buzzer, LED control, push buttons mounted together on an open source designed PCB
- Forward & Inverse Kinematics of the Aldebaran NAO robot- Computation, validation & simulation  
Verified the forward & inverse kinematics of NAO robot and simulated their movements in Choregraphe & Webots

## TECHNICAL SKILLS

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**Programming Languages/Tools/OS:** Python, C++, OpenCV, MATLAB, V-REP, Unity, ROS, Gazebo

**Machine Learning Tools/Modules:** Tensorflow, Scikit-learn, Regression, Clustering, Cross-validation

**Hardware:** Raspberry Pi, Arduino, Leap Motion, Basic Electronics Repairing

## EXPERIENCE

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### Publications

- Heuristic Based Optimal Path Planning for Neurosurgical Tumor Ablation, *SPIE Medical Imaging Conference, San Diego, California* **February 2019**  
Reduced the time spent in manual planning and provided an optimum path for the biopsy needle to penetrate through the skull right to the axis of the tumor while avoiding critical structures and maximizing safe ablation region
- Six Sigma Improvement Opportunities in Working Techniques of Bachhpan NGO, *International Conference on Emerging Trends in Mechanical Engineering (ICETME), Vallabh Vidyanagar* **February 2017**  
Improved the teaching-learning process and the overall performance of the slum students & volunteers
- Mechanically Operated Cart for Pesticide Sprayer for Agriculture, *International Journal of Innovative Research in Science, Engineering & Technology (IJIRSET), Volume-5, Issue-5* **May 2016**  
Eliminated the efforts for pumping the pesticides manually and mechanically automatized the entire process

### Community Service

Volunteer, Documentation Head & Chief Operating Officer (COO) at *Bachhpan Charitable Foundation for Children Welfare (a student-run organization which works against child-labor)* **October 2012 – May 2016**