# Siddhesh Naresh Bagkar

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## EDUCATION

- MS in Automotive Engineering, **Clemson University**, South Carolina, USA May 2021
  (Specializing in Vehicle Electronics and Autonomy)
- Bachelors of Engineering in Mechanical Engineering, **Mumbai University,** Mumbai, India May 2016

## CONCEPTUAL COURSEWORK

|| Automotive Electronics Integration || High-Performance Computing for Vehicle Autonomy
|| Autonomous Driving Technologies || Autonomy: Science and Systems
|| Scaled Autonomous Vehicles || Systems Integration Concepts and Methods

## SOFTWARE / LANGUAGES

- ROS, Python, C++
- Matlab, Simulink, Solidworks, AutoCAD, NX, Inventor, Catia, Ansys
- MS-Office: Visio, Excel, Word, PowerPoint, Outlook

## PROFESSIONAL EXPERIENCE

**Clemson University- ICAR || Autonomous Robotic Lab Assistant|| Greenville, USA January 2020 – Ongoing**

- Working on the development of F 1/10th, F1/5th (Autonomous) cars and Turtlebot3 using various simulation and development software and ROS framework.

**Clemson University|| Student patrol officer || South Carolina, USA September 2019 – Ongoing**

- Worked as a student patrol officer to ensure safety of students and the campus.

**HAL Offshore Limited || Assistant Subsea Inspection Engineer** || Mumbai, India **April 2017 – March 2019**

- As an Inspection Engineer responsible for the planning and execution of critical subsea operations such as Installation of subsea well-Head installation, Locating and arresting subsea gas leaks, Subsea pipeline tie-in, and subsea valve operation
- As a technician on board, responsibility included maintaining the electrical and mechanical side of the system such as electrical panels, electrical motors, HVAC system, underwater welding machine, Pressure Chambers, Hydraulic systems, Compressors, Underwater tools, Environment control system and Gas panels.
- Key role in Project Planning and first point of contact for L&T Hydrocarbon-ONGC Jacket survey project.
- Responsible for training new members in the team

**Supreme Offshore Limited || Jr. Engineer (QA/QC)** || Mumbai, India **June 2016 - January 2017**

- As an onsite Jr. QA/QC Engineer carried out the inspection of pipelines & structures using various NDT techniques, hardness testing, Post Weld Heat Treatment, Hydrotesting, and Leak testing
- Assistance for the installation of an Inline Oil-Gas Separator (De-liquidiser).
- Responsible for closely preparing and maintaining all the inspection records of the ongoing work and creating daily progress reports

**Techint Group || Project Intern || Mumbai, India July 2015 - February 2016**

- Designed an Atmospheric Storage Tank API 650 and carried out Analysis of Roof-Supporting Structure for structural acceptance under various working load using ANSYS APDL

- Revised existing structural design increasing structural stability and lifespan

**ONGC || Winter Intern || Mumbai, India** **January 2012- February 2012**

- Assisting the Chief Engineer in providing technical support for Offshore compressor troubleshooting.
- Prepared a complete report on Centrifugal Compressor Surge Control System.

## PROJECTS EXPERIENCE

**Adaptive Cruise Control and Autonomous Lane Keeping**: *Made an RC car by applying Adaptive cruise control and autonomous lane keeping algorithm.*

- The ultrasonic sensor was used for both lane-keeping and Adaptive cruise control. Used Arduino as an onboard development board and **Arduino IDE** for coding. Used **PID controller** for both ACC and Lane keeping and also implemented **PWM** in the coding for the RC car.

**Sensor sensing and object detection**: *Used Ultrasonic sensor for object detection and implemented a Kalman filter for signal processing.*

- This whole project was carried out in 3 tasks: 1st Object detection using a single sensor along with the implementation of the **Kalman filter**. 2nd using two **sensor fusion** and implementation of Kalman filter. 3rd task was the **localization of the object** i.e. finding out the x & y co-ordinate of the object kept in front.

**Lane detection:** *Lane detection with Deep Learning using Segmentation Method*

- Used **Python** for writing the algorithm and used a **segmentation approach** for efficient lane detection.
- Used TuSimple data set for training the model. The data set was processed on the **Palmetto cluster** to get an exposure to the use of HPC. Compared results of different data set training and measured their respective training accuracy.

**Designing a Battery-Electric Vehicle:**

- Given some system-level requirements, making design choices about six different subsystems perspectives: body-in-white, packaging, vehicle dynamics, powertrain, human factors, and systems integration.
- **MATLAB Simulink model** of these subsystems was made and finally **integrated together**. The overarching goal achieved was satisfying all the system-level requirements and ultimately, to **maximize the profit** for the company to 163.7 Million by selling 62079 units of the car.

**Self-driving car**: *Designed a self-driving car using Raspberry Pi 3, Arduino UNO, Image processing and Neural Networks.*

- This Udemy project used **Raspberry pi** as a master device and **Arduino** as a slave device. Image processing was done using the camera module and **OpenCV4**.
- Used **C++** for capturing images and videos. A machine learning algorithm for lane keeping, lane assist and object avoidance.

**Basic ROS projects:** *This consists of several Basic ROS projects for understanding and practical use of ROS.*

- Simulate **TurtleSim** in Keyboard based teleop | Simulate a custom two-wheeled robot using **Python**
  Simulate an R2D2 Star Wars robot in **ROS and Gazebo** |Simulate TurtleSim in Joystick based teleop
  Simulate the famous TurtleBot2 robot in ROS | Run the Hector drone in a ROS Outdoor environment
  ROS Serial with **Arduino Uno & Servo control** |Use basics of MoveIT to run the Panda Pick and place robot.

**Study and Design of Atmospheric Storage Tank:**

- Designed an Atmospheric Storage Tank API 650 and carried out Analysis of Roof-Supporting Structure for structural acceptance under various working load using ANSYS APDL
- Revised existing structural design increasing structural stability and lifespan

## CERTIFICATION

- MATLAB (Livewire, Mumbai)
- NDT Level II (BITT).
- Diesel engine overhauling (ATI, MUMBAI)
- Industrial Safety (IDEMI MSME-Mumbai)
- Robotics Workshop (IEEE, MUMBAI)
- Gas tungsten arc welding (ATI, MUMBAI)
- Hydraulic and Pneumatic (MPTA Education Pune
- CATIA (MSME Indo German, Mumbai)