

# Sagar Shrestha

Homepage: [shresthasagar.gitlab.io](https://shresthasagar.gitlab.io)

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## Education

2012–2016 **Bachelor of Engineering in Electronics and Communication.**  
Pulchowk Campus, Institute of Engineering, Tribhuvan University (Graduated on August 2016).

## Skills

Programming Python, C/C++, Bash, Assembly Programming, MATLAB, JS  
Robotics Robotic Operating System(ROS), Linux, Embedded Programming  
ML Pytorch, Tensorflow, Keras, Gym, Numpy, Scipy, Scikit-learn, Pandas, Matplotlib  
Web Dev HTML, CSS, JS, SQL Flask, ReactJS, Django  
Others Teaching, Training, Project Mangement

## Research and Work Experience

Feb. **Lifelong Multi-agent Pickup and Delivery(MAPD) for Waiter Robots.**  
2019–Present Building Continuous time CBS with Safe Interval Path Planning with Reservation Table (SIPPwRT) as a low-level for lifelong MAPD task, and post-MAPF to handle kinematic constraints.

Jan 2019 - **Large Vocabulary Continuous Speech Recognition(LVCSR) for Nepali Language,**  
August 2019 *Built multiple DNN-HMM models and GMM-HMM models for continuous speech recognition with over 50k vocabulary.*

Dec. **Robotics Engineer and Co-founder at Paaila Technology.**  
2016–Present **Autonomous Navigation:** Occupancy grid mapping, particle-filter localization, TEB local planner and PID controller for navigation of social robots, 'Pari' and 'Ginger'.  
**360 Video Stitching:** Feature Detection and Matching, Homography estimation, seam detection and blending to stitch 12 video camera feeds into 360 panorama.  
**Hotword Detection:** Trained a seq to seq model based on GRU on hotwords.

Nov 2018 - **Chatbot 'Query' on facebook messeger and website for businesses,** *Software Development at Paaila.*  
June 2019 Query answering based on intent and entities using RASA open source toolkit, databases and APIs for chatbot along with dashboard for analytics and content management.

February **Automation at Naulo restaurant,** *Digitized robotic restaurant in DurbarMarg, Nepal.*  
2018 – Built android application for menu ordering, and billing system database along with APIs for interfacing with it. Built waiter robots named 'Ginger' to serve food to the table  
present

Oct **Autonomous Navigation of Wheelchair,** *Final Year Project.*  
2015–Sept Converted an electric wheelchair to autonomous wheelchair SLAM navigation on ROS platform.  
2016

November **Asia Pacific Robot Contest (ABU Robocon),** *2015,Indonesia. 2016,Thailand.*  
2014–June Team Member of Team Nepal. My responsibility was to build navigation system, drive control  
2016 programs, and higher level game strategy and logic implementation

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## Publications

- 2020 **Large Vocabulary Continuous Speech Recognition in Nepali Language**, *Accepted IEEE International Conference on Computer and Communication Systems (ICCCS) 2020*.  
**Sagar Shrestha**, Elina Baral.
- 2016 **Autonomous Navigation of a Mobile Robot in Indoor Environment**, *Zerone Scholar 2016*.  
Bimal Paneru, **Sagar Shrestha**, Niraj Basnet, Rabin Giri, Dinesh Baniya Kshatri.

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## Teaching Experience

- Oct. **Assistant Lecturer and Laboratory Instructor**, *Thapathali Campus, Tribhuvan University*.
- 2019–Present Teaching **Instrumentation II**, an undergraduate-level course consisting of interfacing microprocessor with peripherals, assembly language programming, serial communication, etc.
- Oct **Assistant Lecturer**, *Thapathali Campus, Tribhuvan University*.
- 2016–March Taught **Telecommunication**, an undergraduate-level course consisting of signalling, switching, multiplexing, etc in telecommunication systems.
- 2017
- 2015, 2016 **Crash Courses Trainer**, *Embedded system and Robotics crash courses*.  
Trained students on AVR micro-controller programming, basic electronics and robotics

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## Relevant Independent studies

- Robotics Motion Planning, Reinforcement Learning, Probabilistic Robotics, Algorithms(Coursera)
- ML Deep Learning Specialization(Coursera), Machine Learning, Computer Vision(coursera)
- Mathematics Linear Algebra(MIT OCW 18.06, 18.065), Probability(MIT OCW 6.012), Convex Optimization(Stanford Online), Probabilistic Graphical Models, Statistics(MIT OCW 18.6501)

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## Honors and Achievements

- 2016 **Best Engineering Award** and **Panasonic Award** ABU Robocon 2016, Thailand
- 2015 **Best Idea Award** and **Mabuchi Motor Award** ABU Robocon 2015, Indonesia
- 2014,2015,2016 **First Position** in annual National Technological Festival LOCUS for three years in a row under different themes
- 2012 **IOE Scholarship**, full scholarship for BE study at Pulchowk Campus, Tribhuvan University + **TU Stipend** each semester for falling under top 10 scorers
- 2011,2012 Full Scholarship at Nobel Academy (10+2 college equivalent to junior and senior high school level in US) + College Topper + First Position at Trinity Sci Tech Competition

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## Leadership and Voluntary Works

- 2016 Editor of **Zerone 2016**, yearly college magazine
- 2016 Organizer of **IOE Robocon 2016**, inter-college national robotic contest
- 2015 Built and installed **Charito Ghar**, pre-fabricated houses for earthquake victims
- 2015 Taught 'Scratch' to primary school students to kindle programming interest in them, as part of **Young Leader's Collaboration for Global Health 2015 Project**
- 2015-2016 Co-founded and organized **Tech Talk**, a weekly talk program in college to make presentations on various engineering and scientific topics
- 2019 Panel Discussion on AI in IOT. Subisu Conclave 2019