TANMAY VILAS SAMAK

CONTACT

Phone
+1 (864) 748-7841

Email
tsamak@clemson.edu

LinkedIn
www.linkedin.com/in/samaktanmay

SUMMARY

Having no family background of engineering and technology, I am a self-motivated and persistent young professional with strong critical and analytical thinking skills, and very high attention to detail. I am always open and ready to stretch my limits by acquiring novel knowledge and skills, and applying them to solve problems at hand. I have an earnest desire to pursue theoretical, developmental and experimental research at the intersection of formal and learning based approaches to create socially and situationally aware autonomous systems.

WORK SAMPLES

YouTube
youtube.com/TinkerTwins

GitHub
github.com/Tinker-Twins

Google Play
play.google.com/store/apps/dev?id=8006260557439159252

Google Scholar
scholar.google.com/citations?user=Y0iPBAoAAAAJ

SKILLS

Robotics and Autonomous Systems
Autonomous Vehicles, Mobile Robots, Manipulators

Artificial Intelligence
Algorithms for Intelligent Systems, Machine Learning, Deep Imitation and Reinforcement Learning

Programming
Python, C, C++, Embedded C, C#, MATLAB, Simulink, LabVIEW

Robot Operating System (ROS)

Embedded Platforms
AVR & ARM Microcontrollers, Arduino, Raspberry Pi, Odroid, Jetson Nano, NI cRIO, NI myRIO

Internet of Things (IoT)
NodeMCU (ESP8266)

Circuit Designing and EDA
NI Circuit Design Suite, Proteus, EAGLE, Fritzing

CAD and 3D Modelling
AutoCAD, SOLIDWORKS, 3DS Max, SketchUp

Multiphysics Simulation
ANSYS, COMSOL

Manufacturing Technology
3D Printing, CNC Machining, Laser Cutting

Industrial Automation
Hydraulics, Pneumatics, PLC

Application Development
Unity, MIT App Inventor

Web Development & DBMS
HTML, CSS, JS, SQL

Documentation
Microsoft Office, LaTeX

Graphic Design and Video Editing
CorelDraw, Photoshop, After Effects, Filmora

EXPERIENCE

May 2022 - Present

Graduate Research Assistant
ARMLab, CU-ICAR

Having worked on several research projects in the field of autonomous vehicles, complemented with a solid background in mechatronics engineering, I joined ARMLab at CU-ICAR as a Ph.D. candidate to pursue focused research in the field of vehicle automation. I am contributing towards projects such as VIPR-GS, OpenCAV, AutoDRIVE and F1Tenth.

Jul 2020 - May 2022

Undergraduate Research Intern
Nanyang Technological University, Singapore

I was selected as an India Connect @ NTU 2020 research intern, wherein my team and I developed a simulation system for scaled autonomous vehicles – AutoDRIVE Simulator. Later, I mentored the next batch of IC@N students and headed team SINGABOAT-VRX for the Virtual RobotX Competition 2022. Our team secured the 3rd rank internationally and received several special awards.

Jan 2019 - May 2021

Autonomous Systems Researcher
Autonomous Systems Lab, SRMIST

I have worked on several projects in the field of autonomous systems including robot locomotion, kinematics and dynamics, perception, sensor fusion, mapping, probabilistic localization, SLAM, motion planning and control. I am currently working on traditional as well as learning-based strategies for autonomous systems. My research particularly targets autonomous vehicles and mobile robots including single and multi-agent paradigms.

Aug 2018 - Dec 2018

Mobile Robotics Researcher
NextTech Lab, SRMIST

I carried out research in the field of mobile robotics that was particularly focused on developing control strategies for a single robot as well as coordinated multi-robot swarms. My work mostly involved simulating control algorithms for mobile robots in MATLAB, but I also developed a small differential-drive mobile robot to validate the control strategies in real-world.

EDUCATION

Jul 2017 - May 2021

Clemson University International Center for Automotive Research
Ph.D. Automotive Engineering | GPA: 4.0

Jul 2017 - May 2021

SRM Institute of Science and Technology
B.Tech. Mechatronics Engineering | Silver Medallist | CGPA: 9.63 | Score: 94.71%
[Degree Certificate] [Rank Certificate] [Transcript] [FYP Viva Voce]

SELECT PUBLICATIONS

Preprints

Samak T.V., Samak C.V., Kandhasamy S., Krovi V., Xie M., "AutoDRIVE: A Comprehensive, Flexible and Integrated Cyber-Physical Ecosystem for Enhancing Autonomous Driving Research and Education," *arXiv,* 2022. [Preprint] [Video] [Code]

Samak C.V., Samak T.V., Kandhasamy S., "Autonomous Racing using a Hybrid Imitation-Reinforcement Learning Architecture," *arXiv,* 2021. [Preprint] [Video] [Code]

Journal Articles

Samak T.V., Samak C.V., Kandhasamy S., "Robust Behavioral Cloning for Autonomous Vehicles using End-to-End Imitation Learning," *SAE IJCAV*, 2021; 4(3): pp. 279-295. DOI: 10.4271/12-04-03-0023. [Preprint] [Video] [Code]

Book Chapters

Samak C.V., Samak T.V., Kandhasamy S., "Control Strategies for Autonomous Vehicles," Chapter 02, *Autonomous Driving and Advanced Driver-Assistance Systems (ADAS): Applications, Development, Legal Issues, and Testing,* 1st Edition, CRC Press, 2021; pp. 35-84, DOI: 10.1201/9781003048381. [Preprint] [Video]

Conferences

Samak T.V., Samak C.V., Xie M., "AutoDRIVE Simulator: A Simulator for Scaled Autonomous Vehicle Research and Education," *ICEA CCRIS,* 2021; pp. 1-5, DOI: 10.1145/3483845.3483846. [Preprint] [Presentation] [Video] [Code]

Samak C.V., Samak T.V., Kandhasamy S., "Proximally Optimal Predictive Control Algorithm for Path Tracking of Self-Driving Cars," *RSI AIR,* 2021; art. no. 11, DOI: 10.1145/3478586.3478632. [Preprint] [Presentation] [Video] [Code]

Kandhasamy S., Kuppusamy V.B., Samak T.V., Samak C.V., "Decentralized Motion Planning for Multi-Robot Navigation using Deep Reinforcement Learning," *IEEE ICISS,* 2020; pp. 709-716, DOI: 10.1109/ICISS49785.2020.9316033. [Preprint] [Presentation] [Video] [Code]

Samak T.V., Samak C.V., "AutoDRIVE Simulator," *ROS World,* 2020. [Video] [Code]

Samak T.V., Samak C.V., "Project Antralsrushti," NASA/*NSS ISDC,* 2017. [Report] [Presentation] [Slides] [Poster]

Samak T.V., Samak C.V., "Project SPECTRA," *NASA/NSS ISDC,* 2016. [Report] [Presentation] [Slides] [Poster]

For an exhaustive list of publications, kindly take a look at my LinkedIn profile

PRESS COVERAGE

Jul 15, 2017
The Times of India [Article]

Jun 10, 2017
Dainik Saamana [Article]

May 14, 2017
Maharashtra Times [Article]

Jul 17, 2016
Maharashtra Times [Article]

Jan 30, 2016
Maharashtra Times [Article]

TV Interview
IBN Lokmat [Video]

ORGANIZATIONS

- Association for Computing Machinery
- Society of Automotive Engineers
- The Robotics Society
- Google Developer Community
- Lema Community

REFERENCES

Dr. Venkat Krovi
Michelin Endowed Chair Professor of Vehicle Automation
Department of Automotive Engineering
Clemson University International Center for Automotive Research
Phone: *+1 (864) 283-7114*
Email: *vkrovi@clemson.edu*

Dr. Xie Ming
Associate Professor
School of Mechanical and Aerospace Engineering
Nanyang Technological University, Singapore
Phone: *+65 98379612*
Email: *mmxie@ntu.edu.sg*

Dr. G. Murali
Professor and Head
Department of Mechatronics Engineering
SRM Institute of Science and Technology, India
Phone: *+91 9444103231*
Email: *muralig@srmist.edu.in*

Dr. K. Sivanathan
Assistant Professor (Sr.G.)
Department of Mechatronics Engineering
SRM Institute of Science and Technology, India
Phone: *+91 9840123959*
Email: *sivanatk@srmist.edu.in*

LANGUAGES

Marathi
First Native

Hindi
Second Native

English
Professional Proficiency

Japanese
Limited Proficiency

Sanskrit
Elementary Proficiency

INTERESTS

- Tinkering & Making
- Teaching & Education
- Camping & Trekking
- Cycling & Swimming
- Driving & Road Trips

PATENTS

[in 202141020400] A Double Acting Actuator with a Dual Piston-Cylinder Arrangement

[in 202141020399] An Actuator with a Dual Piston-Cylinder Arrangement

[in 202041046707] An On-Board Hardware Addressing System for a Modular Reconfigurable Robot and a Method Thereof

[in 202041027290] A Mechanism for Varying Moment of Inertia of a Rotating Structure

[in 202041001687] An Apparatus for Inspecting Profile of a Gear

HONOURS & AWARDS

- International third rank and several special awards for *"Team SINGABOAT-VRX"* at Virtual RobotX Competition 2022
- University Silver Medal in B.Tech. Mechatronics Engineering cohort of 2017-21 at SRMIST
- Best Paper Award for paper *"AutoDRIVE Simulator: A Simulator for Scaled Autonomous Vehicle Research and Education"* at CCRIS 2021
- Best Project Award for *"AutoDRIVE – An Integrated Platform for Autonomous Driving Research and Education"* at National Level IEEE Project Competition 2021
- Gold Medal for research paper entitled *"Autonomous Racing using a Hybrid Imitation-Reinforcement Learning Architecture"* at SRM Research Day 2021
- Academic Excellence Scholarship at SRMIST for Academic Years 2018-19, 2019-20 and 2020-21
- NTU-India Connect Research Fellowship 2020
- Gold Medal for research paper entitled *"Deep Learning Based Behavioural Cloning for Motion Control of Autonomous Vehicles"* at SRM Research Day 2020
- Best "Do Engineering Award using LabVIEW" Project Award for *"iWheel"* at SRISHTI 2020 – 7th National Level Technical Project Exhibition and Competition
- Runners Up for *"BlockBOTS"* at Make-A-Thon 4.0 (2020)
- Silver Medal for research paper entitled *"Novel Design of a Magnetically Switchable MOSFET using Magnetoresistive Elements"* at SRM Research Day 2018
- First Prize for *"Project Antralsrushti"* at NASA International Space Settlement Design Contest 2017
- First Prize for *"Project SPECTRA"* at NASA International Space Settlement Design Contest 2016
- First Prize & Innovation Award for *"Wireless Aqua-Cleaner Robot"* at IIT TechFest 2015

For an exhaustive list of honours and awards, kindly take a look at my LinkedIn profile

RECENT PROJECTS

Jul 2020 – Present
AutoDRIVE | An Integrated Platform for Autonomous Driving Research and Education
Apr 2021 – May 2021
Smart City Management | Autonomous Traffic Control using IoT and V2I Communication
Mar 2021 – Apr 2021
Intersection Management | Multi-Agent Intersection Traversal using Deep Reinforcement Learning
Feb 2021 – Mar 2021
Behavioural Cloning | End-to-End Learning for Autonomous Driving with Sim2Real Transfer
Jan 2021 – Feb 2021
Autonomous Parking | Autonomous Parking using Probabilistic Robotics Approach
Aug 2020 – Dec 2020
AutoRACE | Autonomous Racing using a Hybrid Imitation-Reinforcement Learning Architecture
Sep 2020 – Dec 2020
MARL | Multi-Agent Reinforcement Learning for Decentralized Motion Planning and Control
Jan 2020 – May 2020
RoboCUBES | An Intelligent, Modular and Reconfigurable Robotics Platform

For an exhaustive list of projects, kindly take a look at my LinkedIn profile

RELEVANT CERTIFICATIONS

Jul 2020
Self-Driving Car Engineer Nanodegree | Udacity
Apr 2020
Deep Learning Specialization | DeepLearning.AI (Coursera)
Dec 2019
Self-Driving Cars Specialization | University of Toronto (Coursera)
Dec 2019
Autonomous Mobile Robots | ETH Zürich (edX)
Feb 2019 - Apr 2019
PLC Basics, Programming & Interface to Pneumatic Drives | Bosch Rexroth
Sep 2018 - Nov 2018
Basic, Electro & Advanced Pneumatics | Bosch Rexroth
Jul 2018 - Sep 2018
Basic, Electro & Proportional Hydraulics | Bosch Rexroth
Oct 2018
Control of Mobile Robots | Georgia Institute of Technology (Coursera)

For an exhaustive list of certifications, kindly take a look at my LinkedIn profile