Curriculum vitae

PERSONAL INFORMATION

Muthukumar Pandaram

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Summary A versatile and analytical Master's student in Computational Neuroscience with over 2 years of work experience. Possessing a Bachelor's in Mechanical Engineering, I have successfully integrated hardware and software components, leveraging robotics and machine learning techniques. Passionate about working at the intersection of AI and Autonomous Systems

EDUCATION AND TRAINING

Oct 2020 – Present

Master of Science – Computational Neuroscience

Technical University of Berlin, Berlin (Germany)

– Deutschlandstipendium (German National Scholarship) recipient for the academic year 2020-21, awarded by BMBF, Germany and a private sponsor.

Jul 2014 – Apr 2019

Bachelor of Engineering – Mechanical Engineering

PSG College of Technology, Coimbatore (India)

– **CGPA:** 9.52/10 (Batch Topper and Gold Medallist)

WORK EXPERIENCE

Nov 2022 – Present

Working Student

Manipulator Cluster, Gestalt Robotics, Berlin (Germany)

– Developed a grasping solution for bin picking using open source models like DexNet.
– Developing a new software architecture for the robotic manipulation code base.

Skills acquired: Docker, Git, CI/CD, Python, Deep Learning, Linux, ROS, OpenCV, Camera Calibration, PyTorch

Mar 2021 – Oct 2022

Student Research Assistant

Robotics and Biology Lab, Technical University of Berlin, Berlin (Germany)

– Developed the control hardware for soft robotic hands using proportional valves and flow sensors using ROS as middleware. (Funded by Science of Intelligence excellence cluster)

Skills acquired: Python, Micro-controller programming, Linux, ROS, PID control

Nov 2019 – May 2020

Research Intern

Centre for Alternate Cooling Technologies, PSG College of Technology, Coimbatore (India)

– Developed an experimental apparatus for evaluating the performance of a Solar Assisted Liquid Desiccant based air-conditioning system.

Skills acquired: MATLAB, Project management

May 2019 – Aug 2019

Undergraduate Research Intern

Robotics and Manufacturing Automation Lab, McMaster University, Hamilton (Canada)

– Modified a custom written open-source numerical solver in MATLAB and C++ for simulating the hyperelastic behaviour of soft robotic actuators.

Skills acquired: MATLAB, C++

Dec 2019 – Feb 2019

Research Intern

Medical Mechatronics Lab, National University of Singapore, Singapore (Singapore)

– Interfaced a battery-less NFC based transponder platform to get data from analog sensors developed at the Singapore Institute of Neurotechnology (SINAPSE) through an Android app.

Skills acquired: Micro-controller programming, MATLAB

May 2018 – Jul 2018

Summer Research Fellow

Manufacturing Engineering Section, Indian Institute of Technology, Madras, Chennai (India)

– Was one of 20 Summer Fellowship students selected from across the country.
– Developed an algorithm for automated registration of design surfaces (in NURBS surface format) and the manufactured surfaces (reconstructed from 3D LASER scanned point clouds) for inspection of free form surfaces.

Skills acquired: MATLAB, Computational Geometry

May 2017 – Jul 2017

Research Intern

Surgical Technologies lab, University of Leeds, Leeds (United Kingdom)

– Developed a finite element model in ABAQUS to simulate the hyperelastic behaviour of a soft tactile sensor body and compared the different hyperelastic models.

Skills acquired: ABAQUS

ADDITIONAL INFORMATION

Publications

Empirically identifying and computationally modelling the brain-behaviour relationship for human scene categorization. Karapetian, A., Boyanova, A., Pandaram, M., Obermayer, K., Kietzmann, T.C. and Cichy, R.M., 2023. bioRxiv, pp.2023-01.

Soft tactile sensors with variable compliance. Azim, S., Srinivasan, A., Pandaram, M., Kow, J., De Boer, G., Wang, H., Alazmani, A. and Culmer, P., 2017. In 2017 IEEE SENSORS (pp. 1-3). IEEE.

Lab Rotation Projects

Neural Mechanisms of real world visual categorical decisions, Neural Dynamics of Visual Cognition Lab, FU Berlin

Context based classification using a bandit modulated feed forward classifier, Sprekeler Lab, TU Berlin

Relevant Courses taken

Machine Intelligence, Robotics, Applications of Robotics and Autonomous systems

Course Projects

Motion Planning Implementation and Autonomous Car Simulation using Autoware Auto and LGSVL

– Implemented motion planning nodes using Autoware Auto built on ROS 2 for decision-making and trajectory generation, while simulating car behavior in LGSVL for testing and validation.

Particle Filter-based Monte Carlo localisation Implementation on a Mobile Robot

– Implemented a particle filter-based localisation algorithm in C++ for accurate localization on a mobile robot platform.

Technical Skills

Programming Languages: C, C++, Python, MATLAB

Middleware: ROS

Other: PyTorch, OpenCV, Docker, Git, Linux(Bash)

CAD/CAE: PTC Creo, SolidWorks, ANSYS, Abaqus

PERSONAL SKILLS

Language(s)

English (CEFR level C1), German (CEFR level A1)