Tanay Choudhary

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SUMMARY

Senior Robotics Software Engineer with 5+ years of industry experience across robot navigation, manipulation, localization, sensing, and perception. I intend to contribute to meaningful emerging applications of robotics in the real world.

EDUCATION

NORTHWESTERN UNIVERSITY
MS in Robotics
Dec 2016 | Evanston, IL
GPA: 3.89 / 4

BITS PILANI UNIVERSITY
BE (Hons) in Mechanical Engineering
Aug 2015 | Goa, India

LINKS

LinkedIn: **linkedin.com/in/tanayc**
Portfolio: **tanay-choudhary.github.io**
Github: **github.com/tanay-bits**

COURSES/ CERTIFICATIONS

Data Structures and Algorithms
Nanodegree (Udacity)
Robotic Manipulation
Machine Learning
Computer Vision
Artificial Intelligence
Controls

SKILLS/TOOLS

Meta-Skills
• Agile Software Development
• Critical Thinking • Resilience

Programming Languages
• C++ • Python • Java • Bash

Operating System
• Linux

SW Libraries and Tools
• ROS • Gazebo • PCL
• OpenCV • Git • Gerrit
• Jenkins • Ansible

EXPERIENCE

VECNA ROBOTICS | Senior Robotics Software Engineer
Robot Autonomy | Oct 2018 – present, Waltham, MA
• Responsible for developing, integrating, testing, deploying, and maintaining the autonomy stack of Vecna's suite of mobile heavy material handling robots
• As the module owner for navigation, developed best-in-class path planning and obstacle avoidance features which significantly improved speed and robustness in tight, dynamic spaces
• Brought key improvements to pallet docking behaviors which increased pallet handling reliability and throughput in long, densely packed lanes
• Led autonomy software design, development, and integration for a new, low-cost, collaborative robot product
• Unlocked an untapped use-case by leading a team which developed autonomy SW for a completely new platform for robotic shelf picking
• As the C++ domain expert, discussed and documented best practices, encouraged their use via code reviews, emphasized removal of tech debt

VECNA TECHNOLOGIES | Robotics Software Engineer
Robot Autonomy | Mar 2017 – Sep 2018, Cambridge, MA
• Implemented 3D teleoperation, control, and path planning modules for a dual arm mobile manipulator using C++, ROS, RViz and MoveIt
• Integrated a grasp pose detection library for autonomous picking of arbitrary objects using CNN on point cloud data from a depth sensor

HARMAN INTERNATIONAL | Summer Intern, Future Experience
Corporate Technology Group | Jun 2016 – Sep 2016, Mountain View, CA
Exploratory R&D and rapid end-to-end prototyping of a new kind of headphones with ungrounded force actuators to provide instinctive, non-visual and non-auditory feedback to the wearer. I designed and created fully working prototypes, and showcased them to the broader research and business teams.

TECHNICAL UNIVERSITY OF DARMSTADT | Bachelor's Thesis
Lauflabor Locomotion Lab | Feb 2015 – May 2015, Germany
Thesis title: Gait Analysis and Control Design for Stair Ambulation with Lower-Limb Powered Prostheses | Advisor: Prof. Andre Seyfarth
Performed motion-capture gait experiments on an instrumented staircase, processed the raw data in MATLAB, contributed two new control insights for gait intent and gait percent detection in wearable lower-extremity robots, and obtained significant savings in Series Elastic Actuator peak power and energy requirements

OTHER PROJECTS

Mobile Robot Control and Localization on Frictionless Surface
• Built a lightweight robot which can float on an air-hockey table, and control its orientation using reaction wheels and IMU
• Reverse engineered the SteamVR Lighthouse tracking technology (used in HTC Vive) for localizing the robot

Intuitive Teleoperation of a Dual Arm Manipulator
• Created a ROS package for the Baxter robot, which uses skeleton data from a depth camera to track user's hand movements via joint velocity control
• Developed a custom numerical inverse kinematics solver which finds the optimum set of joint angles to minimize joint travel in addition to reaching target end-effector position
• Featured in National Robotics Week exhibit at the Chicago Museum of Science & Industry