Shrinath Deshpande

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Education

- **Stony Brook University** — Stony Brook, NY
  Ph.D. (Major: Mechanical, Minor: Computer Science) — *Aug. 2015 – Present*
  - **Relevent Coursework**: Computer Vision, Machine Learning, Analysis of Algorithms, Computational Geometry, Advanced Control Systems, Robotics, Geometric Modelling for CAD, Product Design Optimization

Experience

- **Stony Brook University** — Stony Brook, NY
  Research Assistant — *May 2016 – Present*
  - **Machine Learning**: Research on machine learning techniques for kinematic synthesis of planar mechanisms. Performed dimensionality reduction using Auto-Encoders. Developed a data driven approach to mechanism synthesis.
  - **Optimization**: Developed a optimization routine for linkage synthesis. Led to award winning publication for solving practical synthesis problems (doi: 10.1115/1.4037801)
  - **MotionGen: Website, iOs and Android App for Linkage Synthesis**: Developed core modules of a cross platform App for planar mechanism synthesis and simulation. Written in Javascript, HTML, CSS and built with Apache Cordova framework.
- **Stony Brook University** — Stony Brook, NY
  Teaching Assistant — *Aug 2015 – May 2016*
  - **Teaching Assistant - Design Innovation, Engineering Dynamics**: The undergraduate courses at Stony Brook University, had more than 200 students per course enrolled. Involved in creating assignment, exams and conducting recitation sessions.

Relevant Projects

- **Visual Odometry (Oct 2017 – Dec 2017)**: Monocular Visual Odometry using Deep Learning. Implemented the paper "DeepVO: Towards end-to-end visual odometry with deep Recurrent Convolutional Neural Networks" in Tensorflow and OpenCV.
- **Unsupervised Machine Learning (Sep 2017 – Dec 2017)**: Developed a data driven approach to motion synthesis. Performed dimensionality reduction using Autoencoder Neural Networks. Resulted in quick and efficient motion queries for mechanism synthesis.
- **MotionGen (Dec 2015 – June 2017)**: A cross platform App for planar mechanism synthesis and simulation. Implemented several modules including Tolerance Based Synthesis, B-Spline Curve Generation. Worked with open source Apache Cordova framework for iOs and Android implementations.
- **Central Trajectory Problem (March 2017 – May 2017)**: Developed an algorithm for finding valid representative trajectory among n time stamped trajectories. Algorithm based on dijkstra's shortest path. Implemented in C++ using CGAL, OpenGL, Boost libraries
- **Motion Planning of a car (Oct 2016 – Dec 2016)**: Performed planning and optimal control of a car in drifting conditions using GPOPS-II. MATLAB based implementation available at deshpandeshrinath.github.io
- **Motion Planning of a Serial Manipulator (March 2016 – May 2016)**: MATLAB based implementation of Trajectory Planning and Inverse Kinematics of Baxter Arm for Planar Pushing Task.
- **Interactive Manipulation of NURBS Surfaces(March 2016 – May 2016)**: QT5, OpenGL based implementation in C++ for interactive manipulation of Non Uniform Rational B-Spline Surfaces.

Skills

- **Languages**: Proficient in Python, Javascript, MATLAB. Familiar with C++, HTML, CSS
- **Technologies**: Experienced with Git, Tensorflow, OpenCV, Numpy, Scikit-learn, Unix/Linux, Boost, STL, Apache Cordova

Awards

- **A.T. Yang Award in Theoretical Kinematics (Aug 2017)**: Awarded $1000 for Best Paper at ASME Mechanisms and Robotics Conference, Cleveland, OH, August, 2017