

Shubham Agrawal

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EDUCATION

Columbia University in the City of New York

Master of Science in Computer Science; CGPA: 3.92/4.0

New York, NY

Aug 2019 - Dec 2020 (expected)

Indian Institute of Technology Kanpur

Bachelor of Technology in Computer Science; CGPA: 8.7/10.0

Kanpur, India

Jul 2013 - Apr 2017

EXPERIENCE

Tesla Inc

Autopilot Intern (Non Disclosure Agreement)

Palo Alto, USA (remote)

Jun 2020 - Aug 2020

- Worked on identifying and associating same objects visible in multiple cameras to create object tracks across time. Wrote verification scripts for object tracks outlier rejection component

Adobe Inc

Member of Technical Staff (C++, JavaScript Software Developer)

Noida, India

Jul 2017 - Jan 2019

- Implemented CRUD operations for highlight/underline/sticky notes for next generation PDF webview using Javascript. Formulated efficient algorithm for modeling an annotation's position across multiple PDF views (with variable structure and content)

Adobe Inc

Research Intern (Machine Learning)

Bangalore, India

May 2016 - Aug 2016 (voluntarily working till Jun 2017)

- Created a novel end-to-end system for automated design of affinity (user's interest) based smart geo-fences for selective targeting. **US Patent** US20180232767A1 [✉](#) . **Conference paper** Smart Geo-fencing with Location Sensitive Product Affinity [✉](#) , ACM SIGSPATIAL 17

PROJECTS

- **Fit2Form: 3D Generative Model for Robot Gripper Form Design**: Given an object to be grasped, generate a pair of fingers for parallel jaw gripper that maximize the design objectives (i.e., grasp success, stability, and robustness). Grasp success on unseen test set- general purpose baseline 25.8%, task specific baseline 78%, Fit2Form 88.9%. **First author conference paper** under submission to CoRL 2020.
- **Automatic Differentiation and Continuous Sensitivity Analysis of Rigid Body Dynamics**: Worked on physics simulator that allows parameter estimation for nonlinear dynamical systems using automatic differentiation. Implemented Adjoint Method for getting fast differentials of integrated ODEs using C++ template metaprogramming. **Arxiv Paper** [✉](#) .
- **3D Style transfer**: from 2D images to 3D meshes for novel view synthesis. Two 3d mesh representations are used: neural-mesh-renderer and deep-voxels which provide a differentiable way to render mesh images from multiple viewpoints. Using these representations, we optimize the original mesh by applying style loss to the generated images. **Code** [✉](#) , **Report** [✉](#) .
- **Kaggle Diabetic Retinopathy Classification**: Predicted the severity of an input image given 3K labeled retina images. Used several pre-processing steps (CLAHE, smoothing, blood vessels segmentation) to remove noise and variable lighting conditions using OpenCV. EfficientNet-B2 and TTA gave an optimized kappa score of 0.895 and an overall standing 1311/2943 on leaderboard. **Code** [✉](#) .
- **Porn Block**: Chrome extension for realtime identification and blurring of sensual images from webpages. Trained VGG-net on scrapped data using KerasJS. Wrote a proxy server to bypass CORS while generating the client-side image matrix. **Code** [✉](#) .

SKILLS

- **Languages**: C++, Python, JavaScript
- **Libraries**: PyTorch, PyTorch-Distributed, Ray distributed applications, Scikit-Learn, Stan-Math, Eigen, OpenCV, Numpy, Pandas

ACHIEVEMENTS & EXTRACURRICULAR

- **Course Assistant Fellowship**, Columbia University: awarded for stellar academic performance and outstanding work as a TA. Includes full tuition waiver for the semester and an additional stipend
- **US Patent** US20180232767A1 [✉](#) Smart Geo-fencing with Location Sensitive Product Affinity
- **Course assistantships**: Computational Aspects of Robotics [✉](#) , Applied Machine Learning [✉](#) , Advanced Database Systems [✉](#)
- **Research assistantships**: Shuran Song Columbia University [✉](#) (Sept 2019 - present), Gaurav Sukhatame USC [✉](#) (May 2019 - Aug 2019)
- **All India Rank 191**, IIT-JEE Advanced 2013 (among 150K candidates)
- Received *Academic Excellence Award* for excellent academic performance during 2013-14 curriculum at IIT Kanpur
- Received *Best Rookie Team Award*, and *Design Finalists*, BAJA Student India 2015 (an inter-collegiate all-terrain vehicle design competition)
- Served as CS Department Senator at Viterbi Graduate Student Association, University of Southern California for spring semester, 2019
- Co-created TOEFL Infinite [✉](#) , an android application for TOEFL and GRE exam preparation with 150K downloads on Google Play