

Shubham Jain

PERSONAL DATA

PLACE AND YEAR OF BIRTH: Mumbai, India | 1994
WEBSITE: shubhamjain0594.github.io

EDUCATION

JUL 2012 - May 2016 Bachelors of Technology with Honors in COMPUTER SCIENCE AND ENGINEERING
Indian Institute of Technology - Bombay, India
Thesis: "Real Time Air Quality Sensing Network" | Advisor: [Bhaskaran RAMAN](#)
CGPA: 8.86/10

RESEARCH INTERESTS

Practical Privacy-Enhancing Technologies, Distributed Systems, Security and Privacy in IoT, Applied Machine Learning.

WORK EXPERIENCE

JAN 2018 - CURRENT	<p>Research Assistant, Imperial College London <i>Computational Privacy Group</i></p> <p>Currently, the lead developer involved in the design and the development the OPAL Platform. Working under the guidance of Prof. Yves-Alexandre de Montjoye. Responsible for creating a scalable privacy conscientious platform for running any analytics code in a secure manner over pseudonymized telecom data. Designed, developed and optimized the data flow and various microservices in the platform. Implemented the privacy pipelines and differential privacy algorithms for the system. Deploying the system in Senegal and Colombia for the telecom data across multiple years for the country. Designing and developing a live experiment to demonstrate privacy leak through WiFi in smartphones. Designing an experiment to evaluate the effect of the complexity of the machine learning algorithms on the insurance prices in a market. Assisting group in building web portals and developing data sanity and exploration techniques for conducting experiments on a large dataset. Involved in paper reading, presentations, management and other activities of the group.</p>
JUNE 2016 - DEC 2017	<p>AI Scientist and Founding Member at QURE.AI, Mumbai, India <i>Deep Learning in Medical Imaging</i></p> <p>Involved in research across multiple problems in medical imaging. Finished 28th on Kaggle Ultrasound Nerve Segmentation challenge. Open sourced starter code and torchnet tutorial. Collaborated with a medical research institute on brain tumor segmentation and grade classification using perfusion and structural MRIs. Worked on Alzheimer's classification using CNNs with ADNI dataset achieving high accuracy. Developed an internal library for visualization of neural nets, so that they can reason for their inferences without any modification to the original structure of the net. This work done in collaboration with a Columbia Asia Hospitals was presented at RSNA '17. Designed and developed the complete web backend for managing images, authentication and predictions from the model. Built REST APIs using Django and Django-Rest-Framework and deployed the complete setup on Azure cloud. Designed a new loss function for image segmentation that accounts for class imbalance inherently and published the work as part of STACOM Workshop in MICCAI '17. Built end-to-end data-engineering pipelines for transfer of data from Hospitals to Internal servers ensuring data anonymization and preprocessing is done in standardized way. Worked on quantitative evaluation of visualization algorithms for CNNs. Contributed extensively in building the culture of the company and was actively involved in hiring and blogging.</p>
SUMMER 2015	<p>Intern at SAMSUNG ELECTRONICS, South Korea <i>Common Platforms Lab, Software R&D Centre</i></p> <p>Optimized the CLIPS rule engine (open source rule engine developed by NASA) used in the context-trigger API of Tizen OS - used in wide range of Samsung devices, created preliminary features to extend the functionality of the context trigger module, also designed and developed new language to write rules for the context-trigger API making API usage simple and intuitive for developers.</p>
SUMMER 2014	<p>Intern at CHRONUS CORPORATIONS, Chennai, India</p> <p>Designed and developed an add-on for Google Docs to make process of reviewing documents simpler. Used Google Apps Script and Google Drive APIs extensively to make the add-on feature extensive and intuitive to use.</p>

PUBLICATIONS

- OCT 2018 "OPAL: High performance platform for large-scale privacy-preserving location data analytics" A Oehmichen*, S Jain*, A Gadotti*, Y de-Montjoye. et al. - IEEE International Conference on Data Engineering 2018 (Under Review)
- SEP 2017 "2D-3D Fully Convolutional Neural Networks for Cardiac MR Segmentation", Jay Patravali*, Shubham Jain*, Sasank Chilamkurthy, 8th International Workshop, STACOM 2017, Held in Conjunction with MICCAI 2017, Quebec City, Canada.
- MAY 2018 "Deep Learning Techniques for Automatic MRI Cardiac Multi-structures Segmentation and Diagnosis: Is the Problem Solved?" O Bernard, A Lalande, C Zotti, F Cervenansky, X Yang. et al. - IEEE Transactions on Medical Imaging, 2018

PRESENTATIONS

- APRIL 2017 "Building Algorithms we can trust", Shubham Jain, [Re-Work - Deep Learning Summit, Singapore, 2017](#)
- MAR 2018 "Efficacy of deep learning for screening pulmonary tuberculosis", P Putha, M Tadepalli, S Jain, et al.; [Scientific Sessions, European Congress of Radiology](#), Vienna, Austria, 2018.
- MAR 2018 "Identifying pulmonary consolidation in Chest X Rays using deep learning", T Nimmada, P Putha, M Tadepalli, S Jain, et al.; [Scientific Sessions, European Congress of Radiology](#), Vienna, Austria, 2018.
- NOV 2017 "Generating Heatmaps to visualize the Evidence of deep learning based diagnosis of Chest X-rays", P Putha, M Tadepalli, K Rao, S Jain, et al.; RSNA, Chicago, USA, 2017. The paper received [Roadie 2017 award](#) for the most popular abstract by page views in the Road to RSNA section on auntminnie.com.
- OCT 2015 Presented the real time air quality monitoring project in [IITBAA-GBF](#) as a startup-idea with a viable business plan in the Environment Sector.

MAJOR ACADEMIC PROJECTS

- | | |
|-------------|--|
| 2015-16 | <p>Real Time Air Quality Sensoring Network
<i>Prof. Bhaskaran Raman, IIT Bombay</i></p> <p>Created a network of low cost air quality monitoring sensors for monitoring and publishing particulate matter data in real time. Project is funded by Development Impact Lab, UC Berkeley. Performed calibration experiments to validate the sensor consistency and behavior in various situations and simulated controlled experiments under the guidance of Prof. Virendra Sethi in CESE for the same. The results serves as a base for researchers to come up with more experiments and establish a standard procedure for calibration of low cost air quality monitoring sensors. Created an open source software to gather the data from the sensors and send to the server. Scraping government real-time data on air quality periodically, and making historical REST APIs available to public which is not done by government. Collaborated with colleges across Mumbai to contribute towards the project, by setting up sensors in their vicinity and involving students to participate, analyze data and recommend solutions.</p> |
| SPRING 2016 | <p>Othello Agent using Reinforcement Learning
<i>Prof. Shivaram Kalyan Krishnan, IIT Bombay</i></p> <p>Implemented Particle Swarm Optimization(PSO) algorithm based evolutionary strategy to learn to play Othello for first time in literature. Compared performance of Covariance Matrix Adaptation - Evolutionary Strategy (CMA-ES) with PSO-ES and found that PSO-ES learns faster when started knowledge free. Established an open source platform and wrote agents (players) for playing Othello with proper documentation so that, it can be used by anyone for further development.</p> |
| AUTUMN 2015 | <p>EvalPro Optimization
<i>Prof. Varsha Apte, IIT Bombay</i></p> <p>EvalPro is an open source plug-in for MOOC platforms for evaluation of programmes. We redesigned the architecture of the application and changed the flow to enable multi-threading and introduced asynchronous background evaluation. Handled all the concurrency issues algorithmically without using any locks to ensure 0% error in tests.</p> |

ACADEMIC ACHIEVEMENTS

- APRIL 2012 Secured **All India Rank 56** in IIT JEE out of 500,000+ candidates
- MAY 2012 Secured **All India Rank 62** in AIEEE out of 1,000,000+ candidates
- 2012 Amongst top 1% at national level in Indian National Mathematics, Physics and Astronomy Olympiad
- 2008 Recipient of **National Talent Search Scholarship** awarded by MHRD, Govt. of India

TEACHING

MACHINE LEARNING	Teaching Assistant Helped the professor to design the content for the course, including flow of lectures, assignments and projects. Conducting tutorials, to help students in understanding the application of the concepts taught. Mentored 9 groups in course projects having diverse range of topics.
SOFTWARE SYSTEMS LAB	Teaching Assistant Served as TA in Autumn 2015 to guide students in the Lab and help them learn various languages and tools used in unix. Also responsible for setting of labs, quizzes and their evaluation and mentoring students for their projects and evaluating them.
MODERN PHYSICS	Teaching Assistant Served as TA for two consecutive years, responsible for teaching and mentoring a group of 40 freshmen.

EXTRAS

CURRENT	Active blogger on personal blog , freelancer and consultant for AI-based projects and open-source contributor to various AI libraries such as visdom , torchnet , pastalog , etc.
OCT 2017	Won HackInOut 4.0 , India's biggest community hackathon. Created an automated Chest X-Rays diagnosis tool.
DEC 2015	Qualified ACM-ICPC Amritapuri Online Round and got selected for Regionals, where our team finished 33rd amongst 200+ teams.
JAN 2013	Designed and manufactured a bot for Robowars by Techfest, IIT Bombay. Reached quarterfinals and were awarded Engineering Excellence Award for the best engineered bot.

LEADERSHIP

2016-17	Organizer, MUMBAI ARTIFICIAL INTELLIGENCE MEETUP Started an AI Meetup in Mumbai in December 2016 to foster a community of individuals interested in AI and want to deep dive into it. Organize monthly sessions to make community aware of latest developments in AI, industrial applications and basics of various branches of AI. All material presented is released in open-source .
2014-15	Core Team Member, STUDENT ALUMNI RELATIONS CELL, IIT Bombay Lead the Web and Software team to make Alumni student interaction more efficient. Built and parametrized the algorithm to shorten the process of mentor allotment by 60%. Ideated and built a Facebook App 'SARCasm' played by more than 500 in 3 days. Developed and launched Android App for freshmen, had over 1000 downloads. Provided web support for first ever Institute Yearbook distributed to over 1000 students. Awarded Institute Organizational Special Mention award for diligent work throughout the tenure.
SPRING 2016	Overall Coordinator, PERFORMING ARTS FESTIVAL, Hostel 2, IIT Bombay Lead the productions team of hostel to create a charming and advanced PAF, Daira. Created a mixture of tech and arts to produce a technically sophisticated production. Constructed switch controlled fountains, disco floor and light switching controlled using arduino, decorated complete prod with usage of LED strips controlled using a single switch. Awarded Pillar of PAF by the Hostel for extra-ordinary efforts in the tenure.

MENTORSHIP

2017 - CURRENT	Mentor, Alumni Student Mentorship Program, IIT Bombay Selected as an Alumni Mentor for last two years for a final or pre-final year undergraduate student. Guiding them to navigate through the last years of their undergraduate life and helping them in making decisions such as during placements, thesis selection, etc. by sharing my knowledge and experience. Thus, giving back to my alma mater in the process.
2015-16	Mentor, Institute Student Mentorship Program, IIT Bombay Mentored a group of 12 freshmen, from across different departments, focusing on their academic and holistic development. Selected from 351 applicants based on peer review and all round performance.