PRASOON PATIDAR

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Ph.D. student at Synergy Labs, Carnegie Mellon University. Working on privacy aware solutions for large scale deployment of IoT frameworks, focusing on integration, interpretability and safety of such systems.

CORE COMPETENCIES

Data Science

IoT Frameworks

Experimental Design

Causal Inference

Machine Learning

Artificial Intelligence

Statistical & Predictive Modelling

Data Mining & Analysis

EDUCATION

- B.Tech.(Computer Science & Engineering) from Indian Institute of Technology, Delhi in 2017
- Studied Networks and Internet of Things at Telecom Bretagne, Rennes, as a cultural exchange student.
- 12th from Little Angel's HS School, MHOW, CBSE Board in 2013 with 88.6%
- 10th from Kendriya Vidyalaya, MHOW, CBSE Board in 2011 with 10/10 Grade point

IT SKILLS

- Languages: Python, MySQL, C, C++, SML, and Prolog
- Web: PHP and JavaScript
- Hardware: Arduino, VHDL, and Contiki
- Software: Netlogo, Logisim, MATLAB, Qt Creator

PROFILE SUMMARY

- Co-authored research paper on **privacy aware offloading for local-cloud hybrid** IoT deployments. submitted for **IoTDI' 21.**
- Led all phases of data management as a Data Scientist; right from collection, analysis, summarization, findings, presentations to transformation of data in a meaningful manner for business requirements.
- Co-authored research paper on modelling multi-purchase choice behaviour and **optimizing product recommendations** in retail settings, accepted for poster presentation at sets and partitions workshop, **NeurIPS, Dec'19** and submitted for publication in MSOM (Manufacturing Services and Operations Management) journal.
- Managed **Experimental Design and Evaluation for Energy Efficiency (EE)** Projects with Bidgely Technologies as SME.
- Co-authored research paper on understanding of **network flows** in a probabilistic system and presented research in IISA(International Indian Statistical Association) Conference, Dec'17, published in **IEEE Xplore, Jun'19.**
- Completed B-Tech Thesis on **Analysis and Modelling of Delhi Govt. Schools** with Education Directorate of Delhi, from Nov'16-May'17.

RESEARCH EXPERIENCE

Title: **SSIoT: Practical, Privacy Aware Offloading for Hybrid IoT Deployments**
Guide: Prof. Yuvraj Aggarwal, Associate Professor, Carnegie Mellon University
Period: Sep'20-Present
Responsibilities:

- Developing privacy-aware framework (SSIoT) to enable end to end deployment and management of offloading compute heavy tasks on user's private cloud
- Designing experiments to recreate proprietary services provided by popular IoT device manufacturers for SSIoT framework, to assess its feasibility and efficiency

Highlights:

- Submitted for 6th conference on IoT Design and Implementation (IoTDI) 2021

Title: **Optimizing Recommendation when customers select multiple products**
Guide: Dr Theja Tulabandhula, Associate Professor, UIC-Business School
Period: May'19-Dec'19
Responsibilities:

- Conceived a generic multi-choice purchase behaviour model (BundleMVL) to capture effect of product interactions on their utilities
- Empirically proven effectivity of BundleMVL model with state-of-the-art models on 5+ real life datasets
- Devised new optimization models for product recommendations using Non-Linear Mixed Integer Programs
- Formulated heuristic based approaches for real-time assortment optimization beyond 1000+ products

Highlights:

- Accepted for poster presentation in NeurIPS Conference, Dec'19
- Submitted in MSOM(Manufacturing & Services Operations Management) Journal 2020

Title: **Network Flow Optimization through Monte Carlo Simulation**
Guide: Dr Sayaji Hande, Adjunct Professor, ICFAI Foundation for Higher Education
Period: Mar'17-Jul'17
Responsibilities:

- Conceptualized an innovative extension of Little's Law to over 2 nodes by exploiting Queueing and Markovian theories
- Hypothesized & proved node's net arrival rate to be weighted sum of incoming transitions' stationary probabilities
- Developed Monte Carlo Simulation Tool for managing over 10000 customer process flows with over 100 nodes

Knowledge Purview

- Engineering Mechanics, Data Structures & Algorithm, Discrete Structures, and Digital Logic & Design
- Computer Architecture, Programming Languages, and Finite Automata & Theory of Computation
- Database Management Systems, Numerical Algorithms, Machine Learning and Graphical Models

Personal Details

Date of Birth: 2nd Feb 1996
Languages Known: English, Hindi
Website: prasoonpatidar.me
GitHub: prasoonpatidar123
LinkedIn: prasoonpatidar

- Simulated & compiled resource usage and processed time plots enabling tool user to pinpoint troublesome nodes

Highlights:

- Presented research in IISA (International Indian Statistical Association) Conference, Dec'17
- Presented research in PDGC (Parallel, Distributed and grid computing) Conference, Dec'18. Selected for Publication in IEEE Xplore Jun'19

B-Tech Thesis

Title: **Analysis and Modelling of Delhi Govt. Schools**
Supervisor: Dr Parag Singla, Associate Professor, IIT Delhi
Period: Nov'16-May'17

- Provided data-driven insights to create more targeted policies towards improvement of collective results of all schools
- Exploited school inspection and UDISE data, to create regression and classification models for studying impact on examination results.
- Studied correlation between various departments of schools including infrastructure, accounting etc to quantify their individual contribution.
- Utilized various ML Tools including bagging & boosting and ensembled models to enhance accuracy on dataset of 1024 schools & 60+ features

Highlights:

- Established an order of importance for different divisions of schools in carrying better results in board examination
- Predicted results of all schools in 5 classification buckets with 70% accuracy

Organisational Experience

Aug'17- Aug'20 with Bidgely Technologies, Bangalore as Data Scientist

Key Result Areas:

- Applied advanced statistical & predictive modelling techniques and utilizing regression methods to estimate global impact of Bidgely's engagement on customers for energy savings
- Created automation pipeline for various Energy Efficiency experiments and verification reports on a periodic basis
- Curated personalized lifestyle attributes for customers based on their energy usage patterns to improve quality of targeted rebate programs and user recommendations

Industrial Training

May'16- Jul'16 with Bidgely Technologies, Bangalore as Data Science Intern

Title: **Detection of Dryer and Cooking usage for North American Homes, Bidgely**

Responsibilities:

- Detected patterns for fast pulsing appliances in power-time series to predict time of usage and estimate electrical consumption for each run
- Incorporated SVM classifier and feature selection methods to build a 3-classifier for detecting dryer and multiple modes of cooking
- Successfully assessed proposed algorithm with dryer (precision:88%, recall:93%) and Cooking (precision:95%, recall:72%) on 1000+ North American Homes

Projects Undertaken

Title: **Traffic Prediction and Analysis in LoRa Networks** (Sep'15-Dec'15)

- Modelled an online learning-based time series method to maximize network bandwidth utilization
- Conducted time series analysis for Radio Networks, prepared a visual encoder on Long Range Radio antennas, researched on Auto Regressive Moving Average Models, and designed an authentication gateway for users & IoT devices interaction

Title: **Energy Growth Rates in Leaky Fermi Accelerators** (Aug'14-Feb'15)

- Developed statistical analytic simulation models, fabricated trapezium models for single particle simulation, and exploited CUDA (C++) & arbitrary precision methods to enhance bandwidth of accurate modelling