Dhruvesh **Patel**

Software Developer · Machine Learning Engineer

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"Curiosity is the kindling to the flame of knowledge"

Work Experience

Kenome [link] — *Bangalore, India*

Software Development Engineer, Machine Learning — *Feb. 2018 - PRESENT*

- As the lead deaveloper, conceptualized and developed a deep recurrent neural network based time series prediction engine, called KIP-Timeseries, which uses structured time series signals as well as unstructured text data to make predictions *(Python, Tensorflow, Scikit-learn, TF-serving, Numpy, Pandas)*
- Designed the engine to be —
  - Versatile: To produce predictions for different types of time series data ranging from demand forecasting (count valued) to stock-market price (real valued)
  - Scalable: To including any number of structured and unstructured data sources
  - Adaptable: To produce point as well as probabilistic predictions. [link]
- Deployed KIP-Timeseries to create a crypto-currency price prediction tool called TrakCrypto which is currently being used by more than 30,000 subscribers *(Python, Java, Scrapy, Apache Nutch, Elasticsearch, Mongodb, Apache Airflow, TF-serving, NLTK, Flask, Plotly)* [article] [vid]

MathWorks — *Bangalore, India*

Software Engineer — *Jul. 2016 - Jan. 2018*

- To eliminate redundant memory use and to unify incoherent interfaces, refactored core classes of Simulink by reimplementing critical data-structures which resulted in a reduction of around 500 bytes in memory usage per Simulink block translating into several megabytes for large models. *(C++11/17, gcc, clang, gdb, gprof, C++ multithreading)*
- Implemented a cross-team cross-platform feature using C++, JAVA and MATLAB at various levels of the software stack to facilitate early release of several depended features. Drove the project to completion within two months by coordinating development efforts from multiple teams.

Robotics Lab., Dept. of Engineering Design, IIT Madras — *Chennai, India*

Research and Design Engineer — *Dec. 2014 - May. 2015*

- To build a Vehicle Motion Simulator, formulated its mathematical model using Lagrangian Mechanics, solved the forward and inverse kinematics equations for MaPaMan, a 3-DoF spatial parallel manipulator which was the base for the simulator *(Mathematica, MATLAB)*
- Finalized the design parameters by formulating a multi-objective optimization problem using motion constraints and the mathematical model of the manipulator; solved it using genetic optimization scheme called NSGA-II *(C/C++)*

Research & Publications

Computing the Safe Working Zone of a 3-RRS Parallel Manipulator [pub] — *Nates, France*

New Trends in Mechanism and Machine Science. Mechanisms and Machine Science, vol 43. Springer [book] — *Sep. 2016*

- Introduced and implemented in C++, an algorithm for computing the Safe Working Zone (singularity free zone) of parallel robot manipulators

Projects

- **Polymetic –** A fast C++ library for polynomial and matrix arithmetic, focused on applications in Kinematics. *(C++, BOOST)* [git] [web]
- **Intelibugger –** A debugging automation framework for C++ on Linux, inspired from LLVM. *(C++, Linux ptrace)* [git]
- **I-Glide –** A self-balancing transportation device that addresses the short distance transportation (2-5 km) issues of people *(Arduino, C++, MATLAB)* [web] [report]

Education

Indian Institute of Technology Madras — *Chennai, India*

BTech + MTech (Dual Degree), Engineering Design with minor in robotics (CGPA: 8.36 | Class Rank: 5/41) — *Aug. 2011 - Aug. 2016*

Courses

Computing	Computation and Visualization | Graph Search, Shortest Paths, and Data Structures [Stanford, Coursera] | Greedy Algorithms, Minimum Spanning Trees, and Dynamic Programming [Stanford, Coursera] | Theory of Automata and Languages [Stanford, Lagunita] | Differential and Computational Geometry
ML, AI & Math	Introduction to Machine Learning [NPTEL] | Applied Timeseries Analysis | Intro. to AI: Knowledge Representation and Reasoning [NPTEL] | System Identification | Mathematical Statistics | Linear Algebra and Optimization

Teaching

Product Development Lab–II, Dept. of Engineering Design, IIT Madras — *Chennai, India*

Teaching Assistant — *Jan. 2016–Apr. 2016*

Mechanics and design of Mechanisms, Dept. of Engineering Design, IIT Madras — *Chennai, India*

Teaching Assistant — *Aug. 2015–Dec. 2015*

Extracurricular Activities

Hockey Team, Gujarat State

Member & Captain — *Under-14,15,16*

- Led Gujarat state team at Sub-Junior Hockey Nationals and National School Games

Hockey Team, Indian Institute of Technology Madras — *Chennai, India*

Member & Captain — *Member: 2011 - 2016, Captain: 2015-16*

- Won 3 golds (2011, 2012, 2013) and 1 silver (2014) at the annual National Inter-IIT sports tournament; several first as well as second place finishes at regional and state tournaments
- Awarded IIT Madras' best outgoing sports person, 2016

Hostel Council, Ganga Hostel, Indian Institute of Technology Madras — *Chennai, India*

Secretary for Alumni Affairs — *Aug 2013 - July 2014*

- Elected unanimously by an electorate of 350 hostel members to represent the hostel
- Coordinated around 2000 registrations for a specially designed social media platform for the Alumni of IIT Madras
- Conducted the reunion of the batch of 1988, Ganga Hostel, IIT Madras. Used it to raise funds of around 500,000 INR and renovated the hostel playground.

Dpad

Developer and Maintainer

- Developed and now maintain a technology blog about Machine Learning (libraries and theory), Programming Languages, etc. [link]