

TAPESH MANDAL

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DOB : 25-08-1990 , Passport No. K 1744757, Languages known: English, Hindi, Bengali

WORK EXPERIENCE

Software Development Engineer II, Nineleaps, Bangalore (2/July/2018 – 3/July/2019)

I worked as a **python** developer providing data engineering solutions for a client. I was involved in fixing bugs and development of features related to ETLs and data pipelines in python. The work also involved tuning performance of ETLs using coding practices like asynchronous programming and writing unit tests for every new piece of code.

Quality Engineering Intern, Red Hat Bangalore (4/Sept /2017- 8/Feb/2018)

I was an intern with the container-native storage team. It involved GlusterFS with Openshift (Red Hat's version of Kubernetes) in a hypervisor environment. I have contributed by automating test cases in **python** and contributing features to the automation library developed and maintained by the team.

OPEN SOURCE CONTRIBUTOR (2015-present)

Contributor to Mozilla's Automation Projects:

I have fixed 5 bugs for mozilla_ci_tools which is a continuous integration project. The project is entirely written in **python**. The largest patch is of 262 lines regarding scheduling of jobs. I have also written an unit test for mozilla release-services as a part of a hackathon organized by BangPyers (Bangalore Python Users Group).

The other project was called Treeherder which is a dashboard for tests used by Mozilla's automation team. I have fixed 5 user-interface bugs which involved improving and tweaking its UI codebase written in javascript.

Wrote Tests for SuperTux:

I wrote two unittests using Google Test Framework (C++) for SuperTux.org.

TALKS DELIVERED (Academic and non-academic):

- **The art of writing test cases**, Red Hat QECampX Bangalore 17. This was during my internship at Red Hat.
- **Effect of user sentiments in evolution of social networks**, This was part of my M.Tech. curriculum (7th semester) where we had to deliver a seminar on a topic. This talk was highly appreciated by my peers and the supervising faculty.

M.TECH. THESIS

Title : Graph kernels in machine learning

Kernels are used for comparing two inputs. They give a notion of how similar the inputs are. The inputs can be discrete structures such as graphs. In that case, they are known as graph kernels. The graph kernels of interest here are Graphlet kernel and heat kernel. Graphlet kernels offer a way to represent subgraph frequencies as vectors. The major challenge in calculating frequencies of size-k subgraphs is the need to enumerate them all, which is computationally expensive. Hence there need to be a way for estimating the frequencies of the size-k subgraphs from samples only while preserving the frequency distribution on the whole. My work determines a way to estimate the size of a sample in case of random sampling of subgraphs.

Heat kernel is a graph diffusion technique which finds its origin in physics. The expression used for heat propagation in a network is the solution of the popular heat equation and it has been modified in the lines of PageRank diffusion. It finds its usage in community detection, with the flow of heat starting from a seed node. The expression to be evaluated eventually is a Taylor series with the practical constraint of summing up to infinite terms. The most practical way to solve this problem is to use a Taylor polynomial of N terms which acts as an approximation for the above. My work determines the value of N for a given t, such that the error in approximation does not exceed a certain ϵ .

OTHER PROJECTS:

B.Tech. Final Year Project:

Maximum Power Point Tracking of Solar Cells and Inverter design for the same using **MATLAB**.

Hobby Projects:

Chaos - Chaos theory experiment which takes 3 coordinates from the user and using a chaos theory algorithm it unveils a pattern every time. (Python, Pygame)

Wavepy – An oscilloscope interface using Arduino as the platform for signal input which is fed to the computer using USB and plotted on a visual interface. (Python, Pygame, Pyfirmata)

WORKBENCH:

Ubuntu 18.04 LTS, Fedora 25, IDLE, vim, git, github.

Programming languages:

Python, C/C++, Golang, Java, Javascript, HTML, CSS, PHP

EDUCATION

- **ABV Indian Institute of Information Technology & Management, Gwalior**
M.Tech. Advanced Networks (2015-2017) - CGPA : 7.47
- **National Institute of Technology, Mizoram**
B.Tech. Electrical and Electronics Engineering (2010-2014) - CGPA : 7.00

PUBLICATIONS

T. Mandal, W. Wilfred Godfrey, *A strategy for random sampling of sub-graphs used in graphlet kernels*. Journal of The Institution of Engineers (India): Series B (Springer)
(Post revision stage)

T. Mandal, W. Wilfred Godfrey, *Heat Kernel approximation using N-degree Taylor polynomial used in community detection*. In Abstract Proceedings of the International Conference on Emergent Research in Mathematics and Engineering – (ICERME2019), NIT Agartala, 17 - 18 May 2019, pp. 33
(Also journal publication for the same is in progress)

AWARDS AND HONOURS

Best paper presenter award in ICERME 2019.