Shibin George

Android Platform Engineer @ Qualcomm

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Education

National Institute of Technology — *Warangal, India*

Bachelor of Technology, Computer Science and Engineering — *June, 2011 - May, 2015*

- CGPA – 8.44/10.00
- 3-time recipient of Institute Merit scholarship given to top-10 students(CGPA) of Computer Science and Engineering department at the end of each year

M.G.M Sr. Sec. School — *Bhilai, India*

Central Board of Secondary Education, Grade 12 — *May, 2011*

- Scored 92.6%

M.G.M Sr. Sec. School — *Bhilai, India*

Central Board of Secondary Education, Grade 10 — *May, 2009*

- Scored 93.6%

Work Experience

Qualcomm India Private Limited — *Hyderabad, India*

Software Development Engineer — *December, 2016 - Present*

Associate Software Engineer — *June, 2015 - November, 2016*

- Designing and implementing Over-The-Air (OTA) upgrade solutions on Linux Android platform. This is how Android smartphones are upgraded to new software releases.
  The focus is on designing fault-tolerant software - a bug in OTA software can brick your smartphone for good..
- Debugging Android Framework issues and upstreaming fixes to the **Android Open Source Project** (AOSP). I deal with race-conditions, memory-leaks, heap/stack corruptions on a daily basis.
- Developing/maintaining tools that facilitate debugging (of memory-leaks and heap-corruptions for the most part
- Bringing up Android userspace on new Qualcomm Snapdragon chipsets. This calls for extensive knowledge of filesystems(ext4/ubifs), bootup (kernel-to-init), IPC (binder), etc
- I also contribute to the **AOSP**, which is where the Android that runs on your smartphones comes from. This means that atleast a couple of bug-fixes authored by me make their way to millions of Android smartphones regardless of whether they use Qualcomm's Snapdragon chipsets or not.
  To view/review my upstreamed AOSP commits, visit: `https://android-review.googlesource.com/q/shibin`

May, 2014 - July, 2014 — *Qualcomm India Private Limited*

Software Engineering Intern — *Hyderabad, India*

- This was my first experience with the Android OS. I worked on an optimization designed for the Android composition engine (SurfaceFlinger) and built a basic prototype for the same. The project required detailed understanding of Android source code related to the composition engine. (A composition engine is responsible for acquiring windows/layers from various applications and then compositing the final image that gets displayed on your screen)

Publications

Content Based Image Retrieval on Hadoop Framework — *New York*

IEEE International Congress on Big Data, 2015 — *Aug, 2015*

- **Publication URL:** `http://dx.doi.org/10.1109/BigDataCongress.2015.103`.

Weighted finite automata based on local patterns for image authentication — *Anaheim, California*

IEEE International Conference on Semantic Computing, 2015 — *Feb, 2015*

- **Publication URL:** `http://dx.doi.org/10.1109/ICOSC.2015.7050797`.

Projects

Minor Projects

- Chrome extension for saving user sessions and reloading them later.
  Save-The-Session has a little over 3000 active users - **Github**

- As part of *Data Structures & Algorithms* course in sophomore year, I implemented a graph plotter for polynomial equations. It can plot single variable polynomials (y = f(x)) with support for trigonometric functions, basic navigation and zooming in/out. It uses an *Expression tree* for evaluating the value of expression (after converting user-input to postfix format), and *Swing* for GUI - **Github**
- As part of the same course, also implemented a basic Auto-Complete that used *Trie* in the backend for word prediction, and *Swing* for GUI - **Github**.
- As part of *Compiler & Language processors* course in junior year, implemented a compiler for a basic scripting language, with support for arithmetic operations, string manipulations, print-statements, etc. Used *lex* & *yacc* for tokenization and parsing.

Major Projects

Content-based Image retrieval using Local-Tetra Patterns on Hadoop MapReduce framework

- This was my senior-year project. The aim was to implement a popular Image Retrieval algorithm on a distributed computing framework (MapReduce in this case).
- Content based image retrieval extracts features (Local Tetra Patterns in this case) from every image in dataset and then retrieves images from the dataset that falls in the same category as the user-specified image. In simple terms, when the input image specified by the user is that of an elephant, fetch a picture of an elephant from a huge database of pictures of various categories (elephants, houses, vehicles, etc).
- For Mapreduce implementation, the stages involved taking a huge dataset of images and converting them to MapReduce's native SequenceFile type (**Github-stage-1**), extracting image features from SequenceFiles and storing the features on Hadoop's Distributed FileSystem (**Github-stage-2**), and then fetching the results to a user-specified query(**Github-stage-3**).
- The experiments were conducted on institute's High Performance cluster and the results were published in *IEEE International Congress on Big Data, 2015*

Weighted finite automata encoding of images

- This was a spinoff from the project described above. The idea was to explore how feature extraction from an image can be done using Weighted-finite-automata encoding of the same image.
- WFA encoding is a technique primarily meant for image compression but my focus was on exploring its applicability on tamper-detection in images.
- A paper on the same was published in *IEEE International Conference on Semantic Computing, 2015*