Kosma Inoj Akalanka

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Education

University of Moratuwa **Nov. 2016 – July 2021**
Bachelor of Science in Engineering (Honours) *Colombo, Sri Lanka*

- **Major**: Biomedical Engineering
- **Class**: Second Upper
- **GPA**: 3.54
- **Final Year Project**: Measurement of Presence in Virtual Reality Using EEG

Richmond College **Aug. 2013 – Aug. 2015**
General Certificate of Education Advanced Level *Galle, Sri Lanka*

- **Results**: Combined Mathematics (A), Chemistry (A), Physics (B)
- **National Rank**: 336
- **District Rank**: 39
- **Z-Score**: 2.2557

Experience

Synopsys Inc **June 2021 – Present**
Research and Development Engineer II *Colombo, Sri Lanka*

- Working at ZeBu (industry leading FPGA based emulation platform by Synopsys) Engineering Operations and Analytics team.
- Gained expertise in different components of **ZeBu** such as Frontend, zTopBuild, zCoreBuild, zPar, zNetgen, zTime, zFPGA. Also **Automation**, **Data Analytic** and **Web Development** too.
- Worked on end-to-end individual/team projects which improved quality and performance aspects of ZeBu. Also supported existing projects and **regression convergence** too.
- Key projects : Critical Benchmark Analysis Report Generator, Fractal Branch Integration, Nondeterminism Checker, L1 Bulk Breakage Analyzer, Quality Monitoring Systems, Command Coverage Analyzer Optimizations, Maintaining Compile Time Benchmark Comparative Analysis View & ZeBu Regression Scheduler, Jira filing and monitoring.

LE Robotics Pvt Ltd **July 2019 – Dec. 2019**
Research and Development Engineer - Intern *Colombo, Sri Lanka*

- Worked on projects related to a middle scale industrial Robotic Arm Development.
- Gained expertise in **Embedded Systems Development**.
- Key projects : Researched to enhance YOLO object detection algorithm using ARM Assembly language, Developed a customized Printed Circuit Board (PCB) and firmware for a Torque Sensor, Implemented a C# application to calibrate a camera automatically before it is used for object detection.

Projects

Critical Benchmarks Analysis Report Generator | *CSS, Bootstrap, JavaScript, PHP, Python, SQLite* **June 2023**

- An automation was essential to generate an email report which was done manually by ZeBu Backend Product Verification(PV) team.
- Collaborated with above PV team in order to understand the requirements.
- Developed a system with User Interface (UI) where anyone can submit a source excel sheet and generate the email report.
- Email Report contained a bar chart, a pie chart and some tables which summarized findings from analyzing critical benchmark data.
- Utilized **HTML**, **PHP**, **Bootstrap**, **CSS**, **JavaScript** for UI Development and **Python**, **SQLite**, **Jira API for Python**, some **internal APIs**, **HTML**, **CSS** in order to generate email report.

Fractal Branch Integration | *Perforce, C++, Regression testing* **April 2023**

- There was a need for a new branch of a existing release where developers able to checkin and build changelists quickly related to an important project call Fractal. So, current release was then branched to a new branch called "Fractal Branch".
- Provided support in managing the new branch where changelists from the release branch needs to be integrated and build manually in collaboration with a folk from USA timezone.

- Managed an excel sheet, wiki page and teams channel where new builds' info are updated and announced.
- Utilized **Perforce** commands, **C++** knowledge and **Regression testing** while integrating, resolving conflicts, building the executable and submitting changelists. Had to work with folks from different countries like USA, France, Taiwan and India when there are conflicts in changelists while resolving.

Nondeterminism Checker | *jQuery UI, PHP, Csh, Python, SQLite, Cron* **Dec. 2022**

- A check needed to identify whether tests cases' runs are nondeterministic or not.
- Worked with some key testcase owners to dump a hashcode in logs which helps to identify nondeterminism.
- Developed a dashboard with a testcase search/selection where above testcases' runs are summarized and status of the determinism are shown in the tables. When nondeterminism found alerted relevant stakeholders with an email and follow up until nondeterminism fixed.
- Utilized **PHP**, **HTML**, **Bootstrap**, **CSS**, **jQuery UI**, **JavaScript** to develop the frontend and **C Shell Scripts**, **Python**, **SQLite** for the backend. **Cron jobs** were scheduled accordingly for the scripts.

Quality Monitoring System (QMS) | *JavaScript, Google Charts, PHP, Perl, Python, SQLite* **Oct. 2022**

- A system which tracks benchmark quality was needed for some of the key projects in ZeBu.
- Developed a generalized system which contains a dashboard with analytics in the frontend and set of scripts which contains date-wise inputs and databases in the backend.
- System was used by owners of some of the internal key projects in ZeBu.
- **HTML**, **PHP**, **CSS**, **Bootstrap**, **JavaScript** and **Google Charts** were used in the frontend. **Python**, **Perl**, **Jira API for Python**, **SQLite** were used in the backend.

Working with Jira System | *Jira* **Aug. 2022**

- Utilized Jira system for enhancements and fixing bugs.
- Filed Jiras related to testcase failures and followed them up until they were fixed.
- Filed Jiras for enhancements and collaborated with other developers through Jiras until enhancements were completed.

Command Coverage Analyzer report optimization | *HTML, JavaScript, Python* **June 2022**

- Adding new sections and filtering out some rows in the tables of Command Coverage Analyzer report (in HTML) was needed.
- Python script which generates above report was modified after understanding the script.
- Filtering out rows in the HTML report was done by adding an external script wrote using **JavaScript**.

Maintaining CTBM CAN and CTBM ZRS | *Perl, JSON, YAML* **Feb. 2022**

- Supported new updates/changes in Compile Time Benchmark (CTBM) Comparative Analysis View (CAN) and CTBM ZeBu Regression Scheduler (ZRS) systems according to the requests.
- CTBM CAN contains **perl** code base and had to learn some **Perl** in order to cater requests regarding it.
- CTBM ZRS contains **JSON**, **YAML** file formats and had to learn them in order to cater requests.
- There were some special requests to change some sections which are not very much familiar of above 2 systems. Had to did experiments and find solutions by researching.

Objective Measurement of Presence in Virtual Reality (VR) | *C#, Unity, Blender, Virtual Reality* **June 2020**

- This is the Final Year group project, did in the University.
- Utilized VR development, 3D modeling, bio-signals (electroencephalogram, electrocardiogram) and statistical knowledge in order to research for a measurement to quantify presence (someone's engagement) in Virtual Reality.
- Took part in 3D modeling VR Objects using **Blender**, designing questionnaire in **Unity** for VR and conducting the **research** study.
- Analyzed bio-signals collected using statistical methods and published an article with the findings.

YOLO optimization using ARM Assembly | *C++, In-line Assembly, Processor Architecture* **Nov. 2019**

- There was a need in the Robotic Arm which was developing to identify objects' interventions using Raspberry Pi 3B+ when it is moving in its pre-defined trajectory.
- Studied **ARM ISA** in order to find assembly level instructions so that mathematical calculations can be optimized using parallel computations and findings were presented to team members using PowerPoint.
- Applied **ARM architectural**, **microprocessor** and **C++ programming** knowledge in order to optimize You Only Look Once (YOLO) real-time object detection algorithm so that it can be efficiently run on Raspberry Pi 3B+.
- Cooperatively developed **in-line assembly** code in Code Blocks IDE.

PCB & Firmware for a Torque Sensor | *C, Electronics, PCB Designing, SPI, I2C, UART* **Sept. 2019**

- There was a plan to develop a Torque Monitoring System in order to monitor torque values of the joints in a Robotic Arm. Initially PCB and its firmware developments were finalized.
- Utilized electronics (**microcontroller**, **ADC**, **USB-UART converter** etc), PCB designing (**OrCAD**) knowledge and **C programming** knowledge in order to develop a compact **PCB** and its firmware to receive quantified torque values from a torque sensor and send them to a PC for further analysis.
- Also learned communication protocols such as **I2C**, **SPI**, **UART**.

Technical Skills

Languages: Python, C++, C, C#, Perl, HTML/CSS, JavaScript, PHP, SQLite, csh, bash
Developer Tools: Unity, Blender, VS Code, Code Blocks, Visual Studio, Atmel Studio, Vim, Jira
Technologies/Frameworks: Linux, Perforce, GitHub, Bootstrap, Symfony, Beautiful Soup, Latex

Publications

- T. T. N. Bahavan, S. Navaratnarajah, D. Owinda, I. Akalanka, R. Peiris, and A. D. Silva, "Towards an objective measurement of presence, place illusion, and plausibility illusion in virtual reality using electroencephalography." Virtual Reality, 2023, doi: 10.1007/s10055-023-00815-x.
  https://link.springer.com/article/10.1007/s10055-023-00815-x

Professional Qualifications

Institute Of Engineers Sri Lanka - IESL **May 2022 – Present**
Associate Member *IESL*

Honours / Awards

Above & Beyond Team Award **Aug. 2023**
Excellent team effort to improve ZeBu R&D regression TAT with increased coverage *Synopsys Inc*

Execution Excellence Recognition **June 2023**
Successful support for Fractal integration *Synopsys Inc*

Execution Excellence Recognition **May 2023**
Excellent Team Work for MH L0, CCA, L0/L1 Prime *Synopsys Inc*

Above & Beyond Individual Award **Mar. 2022**
Designing and implementing of Quality Monitoring Systems and continuous support in maintaining *Synopsys Inc*

Execution Excellence Recognition **Nov. 2021**
Enhancing CTBM and Automation crons *Synopsys Inc*

Extracurricular

Swimming **2012 – Present**
Trained as a swimmer. Participated school level swimming meets and placed in couple of competitions.

Life Saving **2012 – Present**
Completed Basic, Elementary, Intermediate and Bronze levels and became a Professional Life Guard.

References

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