

KOSMA INOJ AKALANKA

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Education

University of Moratuwa

Bachelor of Science in Engineering (Honors)

Nov. 2016 – July 2021

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

General Certificate of Education Advanced Level

Aug. 2013 – Aug. 2015

Galle, Sri Lanka

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

Experience

Synopsys Inc

Research and Development Engineer II

June 2021 – Dec. 2023

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 : Redundant C++ header cleanup using IWYU, LCOV Dashboard, Critical Benchmark Analysis Report Generator, Fractal Branch Integration, L1 Bulk Breakage Analyzer, Quality Monitoring Systems, Maintaining Compile Time Benchmark Comparative Analysis View & ZeBu Regression Scheduler.

LE Robotics Pvt Ltd

Research and Development Engineer - Intern

July 2019 – Dec. 2019

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

Redundant C++ header cleanup using IWYU tool | C++, Clang, IWYU tool

Nov. 2023

- There was a need to clean redundant header inclusions in ZeBu source code files which were mostly written in C++.
- A tool called **IWYU (Include What You Use)** which is compatible with **Clang** compiler was finalized to use in this purpose.
- Collaborated with ZeBu DevOps team to understand how IWYU could be utilized with ZeBu build (compiling) commands and successfully able to remove redundant headers with manual effort for chosen C++ source code files while gaining size reduction in .o files.
- Started planning an automation using Python as there are lots of source code files to be cleaned up.

LCOV Dashboard | XMLHttpRequest, Shell scripts, Cron jobs

Aug. 2023

- Centralized page was essential to monitor line coverage data and its interpretations for every component in ZeBu.
- Collaborated with coverage team and utilized **Coverage API**, **Jira API** and **Owners API** to gather basic data.
- Identified incorrect owners assigned to multiple components while gathering data and started a separate initiative on correcting them also.
- Implemented dashboard showing useful raw/interpreted data and analytics.
- Utilized **Bootstrap**, **CSS**, **JavaScript**, **XMLHttpRequest**, **Google Charts**, **HTML** in the front-end and **PHP**, **Python**, **SQLite**, **Shell scripts**, **Cron jobs** in the back-end.

Critical Benchmarks Analysis Report Generator | *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 charts and tables which summarized findings from analyzing critical benchmark data.
- Utilized **HTML, Bootstrap, CSS, JavaScript** for UI Development and **PHP, Python, SQLite, Jira API, internal APIs** 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 their code and build quickly related to an important project call Fractal. So, current release was then branched to a new branch called "Fractal Branch".
- Provided support for managing the new branch where changes from the release branch need to be integrated and build manually in collaboration with a folk from USA time-zone.
- Managed an excel sheet, wiki page and teams channel where new builds' info were 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 time-zones like USA, France, Taiwan and India when there were conflicts in changelists while resolving.

Quality Monitoring System (QMS) | *HTML, CSS, Google Charts, Perl, Jira API*

Oct. 2022

- A system which tracks benchmark quality was needed for few important projects in ZeBu.
- Developed a generalized system which contained a dashboard with analytics in the front-end and set of data-mining scripts and databases in the back-end.
- **HTML, CSS, Bootstrap, JavaScript** and **Google Charts** were used in the front-end. **PHP, Python, Perl, Jira API, SQLite** were used in the back-end.

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 **Perl** in order to cater requests regarding that.
- CTBM ZRS contains **JSON, YAML** formats and had to learn them in order to cater its requests.
- There were some special requests to change few sections of above systems which I am not very much familiar with. So, had to experiment and find solution by researching.

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

June 2020

- This is the Final Year group project, conducted at 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 efficiently 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, MATLAB, Scilab, Vim, Jira

Technologies/Frameworks: CI/CD pipeline, 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

Associate Member

May 2022 – Present

IESL

Honours / Awards

Dashboard Competition - 2nd Place

Auto Checkin Approval (ACA) Dashboard

Sept. 2023

Synopsys Inc

Above & Beyond Team Award

Excellent team effort to improve ZeBu R&D regression TAT with increased coverage

Aug. 2023

Synopsys Inc

Execution Excellence Recognition

Successful support for Fractal integration

June 2023

Synopsys Inc

Execution Excellence Recognition

Excellent Team Work for MH L0, CCA, L0/L1 Prime

May 2023

Synopsys Inc

Above & Beyond Individual Award

Designing and implementing of Quality Monitoring Systems and continuous support in maintaining

Mar. 2022

Synopsys Inc

Execution Excellence Recognition

Enhancing CTBM and Automation cons

Nov. 2021

Synopsys Inc

Extracurricular

Swimming

Trained as a swimmer. Participated school level swimming meets and placed in couple of competitions.

2012 – Present

Life Saving

Completed Basic, Elementary, Intermediate and Bronze levels and became a Professional Life Guard.

2012 – Present

References

Subramanian Chebiyam

Dir. R&D - Systems Design Group

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