Kosma Inoj Akalanka

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Work Experience

Jun 2021 - Present

Research & Development Engineer, II at Synopsys Inc.
ZeBu, Automation, Data Analytics, Web Development

Working in ZeBu (Industry leading FPGA based emulation platform by Synopsys) Engineering Operations and Analytics team. Gained expertise in different components in ZeBu such as Frontend, zTopBuild, zCoreBuild, zPar, zNetgen, zTime, zFPGA, etc. Worked on end-to-end projects which improved quality and performance of ZeBu. Supported existing projects. Regression convergence.

Key projects : Critical Benchmark Analysis Report Generator, Fractal Branch Integration, Non-determinism 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

Jul – Dec 2019

Research & Development Engineer - Intern at LE Robotics Pvt Ltd, Colombo
Embedded Systems Development

Worked on projects related to a middle scale industrial Robotic Arm Development.

Key projects : Researched to enhance existing object detection algorithm using ARM Assembly language, Designed and implemented a customized Printed Circuit Board (PCB) for a Torque Sensor, Implemented a C# application to calibrate a camera automatically before it is used for object detection.

Education

Nov 2016 - Jul 2021

University of Moratuwa, Sri Lanka
Bachelor of the Science of Engineering (Honours)
Major: Biomedical Engineering
Final Year Project: "Measurement of Presence in Virtual Reality Using EEG"
Class: Second Upper
GPA: 3.54

Aug 2013 - Aug 2015

Richmond College, Galle
GCE Advanced Level Examination – August 2015
Combined Mathematics (A), Chemistry (A), Physics (B)
National Rank: 336
District Rank: 39
Z-Score: 2.2557

Dec 2010 - Dec 2012

Richmond College, Galle
GCE Ordinary Level Examination – August 2015
8 "A"s, 1 "B"

Publications

[1] 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

Honours & Awards

Jun 2023	Synopsys Execution Excellence Recognition: Successful support for Fractal integration.
May 2023	Synopsys Execution Excellence Recognition: Excellent Team Work for MH L0, CCA, L0/L1 Prime.
Mar 2022	Synopsys Above & Beyond Award: For designing and implementing of Fractal Quality Monitoring System and continuous support provided to maintain it.
Nov 2022	Synopsys ACE 2022 Celebrating Nomination: Nominated for the Best Buddy Award.
Nov 2021	Synopsys Execution Excellence Recognition: For enhancing CTBM and Automation crons

Projects

- Critical Benchmarks Analysis Report Generator 2023
  - An automation was essential to generate an email report which was done manually by ZeBu Backend Product Verificaion(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 contains 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 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** for integrating, resolving conflicts, submitting of changelists. Had to work with folks from different countries like USA, France, Taiwan and India when there are conflicts seeing in changelists while resolving.
- Nondeterminism Checker 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 a mail 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.
- L1 bulk Breakage Analyzer 2022
  - There were frequent bulk failures noticed in L1 test suite which has less frequency of running due to large number of testcases in it. So it was needed to identify these bulk failures earlier. Decided to analyze bulk failures in L1 and find suitable low TAT testcases to include daily running L0 test suite which has only low TAT testcases.
  - Developed an UI where L1 bulk failures can be queried with respect to dates. A table containing error signatures for the bulk failures and suitable L0 candidates was shown. Additionally failing tests counts with respect to dates, percentage of error signature appearance over the time was shown in bar charts and pie charts with clarity.
  - Utilized **Terminal Commands**, **Python**, **SQLite** to analyze L1 logs and identify suitable testcases for L0. **HTML**, **PHP**, **CSS**, **Bootstrap**, **Javascript** was used to develop the UI. **Cron jobs** were scheduled accordingly for the scripts.
- Quality Monitoring System (QMS) 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 is used by owners of some of the internal key projects in ZeBu.
  - **HTML**, **PHP**, **CSS**, **Bootstrap**, **JavaScript** were used in the frontend **Python**, **Jira API for Python**, **SQLite** was used in the backend.
- Working with Jira System
  - Utilized Jira systems for enhancements and fixing bugs.
  - Filed Jiras related to testcase failures and followed them up until they were fixed.
  - Filed Jiras for enhancements and colloborted with other developers through Jiras until enhancements were completed.

- Command Coverage Analyzer report optimization 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 to add new sections in the report output.
  - Filtering out rows in the report was done by adding an external script wrote using **JavaScript** to modify **HTML** content.
- Maintaining Compile Time Benchmark (CTBM) Comparative Analysis View (CAN) and ZeBu Regression Scheduler (ZRS) 2022
  - Supported new updates/changes in CTBM CAN and CTBM 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 **yaml**, **json** file formats and had to learn them in order to cater requests.
  - There were some special requests to change some parts 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) 2020
  - This is the Final Year Project group project did in the last year of 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 in **Blender**, designing questionnaire in **Unity** for VR etc.
  - Analyzed bio-signals gathered using statistical methods and published an article with the findings.
- YOLO optimization using ARM Assembly 2019
  - There was a need in the Robotic Arm which was developing to identify objects' interventions when it is moving its pre-defined trajectory using Raspberry Pi 3B+ attached.
  - 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+.
  - 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.
  - Cooperatively developed **in-line assembly** code in Code Blocks IDE.
- PCB & Firmware for a Torque Sensor 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.
  - This was an individual project where I learned communication protocols such as **I2C**, **SPI**, **UART**. Also I was able to learn best practices in **embedded development** too.

Professional Qualifications

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

Training & Volunteering

- Synopsys Bangalore Collaboration Jan 2023
  Worked at Synopsys Bangalore Office in India for 3 weeks regarding a new project. Participated training sessions organized by senior folks and was able to connect with them in-person.
- Organized "Brainstorm - Sri Lanka's Premier Healthcare Innovation Competition" Oct 2018
- Worked at MoraSpirit under Creative Designing Pillar as a Video Editor/Content Creator/Technical Supporter. 2018
- Organized "Basic Robotic Training Sessions" for school students under grade 11. 2018
- Demonstrator at Exmo Exhibition, University of Moratuwa, for Astronomy Club. Oct 2017

Skills

Programming/ Computing	Python, C, C++, C#, Unity, Blender, Scilab, Perforce, SQLite, Regex, HDL languages (Verilog, SystemVerilog), MATLAB & Simulink, SolidWorks, OrCad, Visual Studio, Atmel Studio, Microsoft Office, csh, bash, JavaScript, HTML, CSS, PHP, Bootstrap, yaml, vim, linux, LaTeX
Language	English (Fluent), Sinhalese

Extra-curricular Activities

Swimming	Trains as a swimmer since 2012. Participated school level swimming meets and placed in couple of competitions.
Life Saving	Trains as a Life Guard since 2012. Passed Basic, Elementary, Intermediate and Bronze levels and became a professional Life Guard.

References

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