Ijtihed Kilani

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Education

Aalto University, 4.0/5.0 GPA — Espoo, FI

Bachelor of Science in Computational Engineering, Minor in Computer Science — *Aug. 2024 – Current*

Relevant Skills

Languages: Python, C#, Scala, JS

Relevant Coursework: Data Structures and Algorithms; Software Engineering; Number Theory

Experience

Research Assistant — Dec 2022 – May 2024

King Abdulaziz University, Biotechnology — *Jeddah, Saudi Arabia*

- Analyzed genetic (SNP) and hematological (CBC) data from 2,200+ patients, identifying altitude-specific molecular and physiological hypoxia adaptations.
- Authored 3 peer-reviewed publications on genetic clustering and hematological variations.
- Mentored 5 researchers and led a team in experimental design, data analysis, and biotechnology R&D.

Research Intern — Jul 2023 – Aug 2023

23rd Summer Research School in Mathematics & Informatics, Computer Science & Applied Math

- Worked on a preprint (under Dr. Stanislav Harizanov) applying informatics, like formulation of recursive relations representing paths in problems & found used like rolling arrays to reduce space complexity to *linear time.*
- Modeled the problem as a Directed Acyclic Graph (DAG) $G(V, E)$ with the common adjacency matrix.
- Delivered presentations on the results to an academic audience of 30+ PhDs.

Projects

The Yappin' Spirit | *C# (.NET), Unity, Python (OpenCV, DeepFace, Flask), Blender, HLSL*

- Developed a real-time emotion detection game integrating OpenCV with Unity to capture and analyze player emotions via webcam.
- Implemented facial recognition algorithm for interactive gameplay which allows response based on emotions.
- Deployed the game entirely on itch.io and presented it in a hackathon to 20+ participants and organizers.

Maze Maverick | *C# (.NET), Unity, Blender*

- Developed and deployed a 3D arcade game inspired by "Pac-Man" to Steam, with procedurally generated mazes, and multiple game modes.
- Implemented a finite state machine (FSM) for enemy AI which allows ghosts to exhibit complex behaviors such as patrolling, chasing, and evading.
- Integrated Unity's post-processing stack for visual effects, including bloom, ambient occlusion.

Quran App | *Flutter, Dart*

- Developed and deployed a Quran application using Flutter and Dart with features such as page pinning and surah scrolling.
- Used procedurally generated pictures for the surahs display & designed for "old school" users due average age.

Publications

Comparative Study of Complete Blood Count Between High-Altitude and Sea-Level Residents | *Python, Excel*

- Second author of a published study analyzing hematological differences due to altitude, involving 2,200 participants (1,160 high-altitude and 1,044 sea-level residents), showing variations in hemoglobin levels and CBC parameters.
- Led the writing, data visualization, and publishing process; conducted comprehensive statistical analyses using Python and Excel, including t-tests and ANOVA, to assess variations in red blood cell counts and hematocrit levels.

Single Nucleotide Polymorphisms in HIF-1A, VEGFa, & VHL Genes | *Excel*

- Second author of a study analyzing SNPs identifying 15 distinct SNPs across HIF-1A, VEGFa, and VHL genes.
- Discovered a 25% SNP occurrence rate in HIF-1A among high-altitude residents versus 11% at sea level; VEGFa SNPs occurred in 40% of high-altitude samples compared to 10% at sea level.
- Phylogenetic clustering revealed clear genetic separation correlated with altitude, which is clear through statistical analyses and visualizations in Excel within altitude-induced hypoxia adaptation.