

# Ijtihed Kilani

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## EDUCATION

### Aalto University, 4.0/5.0 GPA

*Bachelor of Science in Computational Engineering, Minor in Computer Science*

Espoo, FI

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+ participants, 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 the problem & 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 findings & algorithms 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 algorithms for interactive gameplay, allowing 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," 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 & optimized for "old school" usage 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 2,204 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 | Python, 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, leveraging advanced statistical analyses and visualizations in Excel within altitude-induced hypoxia adaptation.