

# Mohamed Abuelanin

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👁 [mr-eyes](https://github.com/mr-eyes)

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## Summary

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**Computer Scientist & Bioinformatics Engineer with 10+ years of experience in software engineering and bioinformatics applications** for microbiome and genomics research. Proven track record of designing scalable, reproducible computational frameworks that enable petabyte-scale NGS data analysis and accelerate scientific discovery.

## Technical Skills

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**Programming** (Python, C++, Rust) - **Web** (WebAssembly, HTML/JS/CSS, Php) - **Databases** (SQL, Neo4J/Cypher, MemGraph) - **Workflows** (Snakemake, NextFlow, WDL) - **DevOps** (Git, CI/CD, unit-testing, Docker, Kubernetes, AWS) - **Distributed systems** (RPC over-network programs) - **Bioinformatics** (NGS analysis, calling variants (SNPs & INDELS), pangenomes, population-level studies, custom scalable software solutions, k-mer-based analysis).

## Education

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### University of California, Davis

*Ph.D. in Computer Science – Thesis: Petabyte-scale sequence characterization*

Davis, CA

Sep. 2020 – Jun. 2024

### Nile University

*M.Sc. in Communication and Information Technology – Thesis: kmer-based sequence partitioning*

Giza, Egypt

Mar. 2017 – Aug. 2020

### Higher Technological Institute

*B.Sc. in Electrical/Biomedical Engineering – Thesis: ML-Based Taxonomic Classification*

Cairo, Egypt

Sep. 2011 – Jan. 2017

## Experience

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### University of California, Davis – Megan Dennis' Lab, Genome Center

*Postdoctoral Researcher – Studying genomic variation across human duplicated genes*

Davis, CA

Jul. 2024 – Present

### University of California, Davis – Titus Brown's Lab, School of Veterinary Medicine

*Graduate Student Researcher – Scalable framework for massive-scale sequence QC*

Davis, CA

Sep. 2020 – Jun. 2024

### Marine Biological Laboratory (MBL)

*Teaching Assistant, Gene Regulatory Networks Workshop*

Woods Hole, MA

Oct. 2023

### University of California, Davis

*Instructor, Data Analysis Collaboratory Workshop*

Davis, CA

Jun. 2023

### Nile University

*Graduate Teaching Assistant, ML, Big Data, and Advanced NGS Courses*

Giza, Egypt

Mar. 2019 – Aug. 2020

### Artronix

*R&D Contract Software Engineer – Programming & Embedded Systems Instructor*

Egypt

Jan. 2013 – Nov. 2017

## Projects

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### snipe

SRA-scale lightweight sequence QC and assessment

### Sequencing ROI

Predict library complexity using alpha-diversity and rarefaction curves

### kProcessor

Efficient Sequence K-mer indexing and Analysis

### DBRetina

Gene Overlap Super Network

### kSpider

K-mer based ultrafast pairwise DNA clustering tool

### sourmash

Metagenome analysis and genome comparison using k-mers

### denovo-rnaseq

De novo assembly, DEGs, and annotation snakemake workflow

### guidedPartitioner

RNA-Seq ref-based reads partitioning for accurate assembly

### kDecontaminator

RNA-Seq Decontamination tool for a cleaner de novo transcriptome assembly

### Codon Optimization Tool

A tool for optimizing cDNA sequences using codon usage bias for DNA vaccines