Baraa Orabi (he/him/his)

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Education

Ph.D. in Computer Science *Sep 2019 - Aug 2024*
University of British Columbia, Supervisors: Drs. Faraz Hach and Cedric Chauve
- Develops novel algorithms and data structures for high throughput genomic and transcriptomic sequencing that focus on minimizing dependence on references.

M.Sc. in Computing Science *Sep 2017 - Dec 2018*
Simon Fraser University, Supervisors: Drs. Faraz Hach and Cedric Chauve
- Thesis: Alignment-free clustering and error correction of UMI tagged DNA molecules

B.Sc. in Computer Engineering *Jan 2013 - Aug 2017*
Bilkent University, Supervisor: Dr. Can Alkan
- Worked on structural variation discovery using combinatorial analysis of 10x Genomics Linked-reads

Research Experience

Research Assistant, Vancouver Prostate Centre *Sep 2017 - present*
- Develops scalable and efficient algorithms for clustering, error-correction, with focus on linked-reads and long-reads technologies.
- Managerial responsibilities including organizing data storage, publishing software packages, and running the lab's social media presence

Research Intern, Genomize Inc. *June 2017 - Aug 2017*
- Worked on integrating different genomic variant callers for use by SEQ, an easy-to-use, genome-based medical diagnostic tool.

Research Volunteer, Bilkent University *Jan 2016 - Aug 2017*
- Worked on genomic structural variation discovery using combinatorial analysis of 10x Genomics Linked-reads.

Work Experience

Academic and Teaching Assistant, UBC *Sep 2019 - Dec 2020*
- **Fall 2020 CPSC221 Basic Algorithms and Data Structures**: Ran three lab sections. Taught and communicated fundamental computer science concepts to 80+ students new to program.
- **Spring 2020 CPSC445 Bioinformatics Algorithms**: Co-designed course curriculum and developed original lecture notes (500+ slides).
- **Fall 2019 CPSC430 Computers and Society**: Held office hours (2 hours/week) and graded 600+ essays by over 100 students.

Software Engineering Intern, Google *Jun 2016 - Aug 2016*
- Implemented a stage of migrating existing Remote Procedure Calls (RPCs) to in-server process calls, including writing A/B tests, on Google Display Ads Network front-end infrastructure

Publications

1. Karaoglanoglu F, **Orabi B**, Chauve C, Hach F. *TKSM: Highly modular, user-customizable, and scalable transcriptomic sequencing long-read simulator.* bioRxiv. 2023. doi:10.1101/2023.06.12.544410. **Under review at OUP Bioinformatics**

2. **Orabi B**, Xie N, McConeghy B, Xuesen D, Chauve C, Hach F. *Freddie: Annotation-independent detection and discovery of transcriptomic alternative splicing isoforms using long-read sequencing.* Nucleic Acids Research. 2023. doi:10.1093/nar/gkac1112. **Accepted to RECOMB 2021**

3. Ebrahimi G, **Orabi B**, Robinson M, Chauve C, Flannigan R, Hach F. *Fast and accurate matching of cellular barcodes across short-reads and long-reads of single-cell RNA-seq experiments.* iScience. 2022. doi:10.1016/j.isci.2022.104530. **Accepted to RECOMB-seq 2022**

4. **Orabi B**, Erhan E, McConeghy B, Volik SV, LeBihan S, Bell R, Collins CC, Chauve C and Hach F. *Alignment-free Clustering of UMI Tagged DNA Molecules.* Bioinformatics. 2018. doi:10.1093/bioinformatics/bty888. **Accepted to RECOMB-seq 2018**

Presentations	*Challenges of Isoform Identification and Discovery Using Long-read Sequencing*

- Terry Fox Seminar Series, podium talk — *Oct 2022*

Freddie: Annotation-independent Detection and Discovery of Transcriptomic Alternative Splicing Isoforms

- RECOMB 2021, podium talk — *Sep 2021*
- ISMB iRNA 2020, short talk — *July 2020*
- Lorne D. Sullivan Lectureship and Research Day, short talk — *July 2020*
- VanBUG, student talk — *Jan 2020*
- Terry Fox Seminar Series, podium talk — *Oct 2019*

Alignment-free Clustering of UMI Tagged DNA Molecules

- SFU OMICS Research Day, short talk — *Jan 2019*
- RECOMB-seq 2018, podium presentation — *Oct 2018*
- BIG Research Day, podium presentation — *Mar 2018*
- VanBUG, lightning talk — *Dec 2017*

Science communication and service

Finance VP, Graduate Student Association — *May 2021 - present*
UBC Department of Computer Science

- Responsible for maintaining the accounting of annual budget and dispersing reimbursements for the graduate student body.

Member, faculty recruiting committee — *Sep 2020 - April 2021*
UBC Department of Computer Science new tenure-track faculty recruiting committee

- Reviewed 60+ applications, interviewed 8 candidates, and organized candidate meetups with with graduate students in the department for the finalist candidates.

Organizer, *VanBUG* — *May 2018 - Aug 2023*
Monthly seminar and social event for the Vancouver bioinformatics community

- Hosts the feature and students speakers, manages the website, and recruits student speakers.

Organizer, *hackseq* — *Mar 2018 - Dec 2020*
Annual Vancouver-based genomics hackathon turning ideas into open source software

- Recruited project leads, managed logistics, and hosted hackseq18 and hackseq19.

Writer, *Al Qafila Magazine* — *Mar 2014 - Apr 2017*
Al Qafila is a bi-monthly Arabic pop science magazine

- Wrote four articles on topics of computer science, philosophy of science, and open source movement.

Co-founder and presenter, *A9far podcast*   *Jun 2013 - Sep 2014*
A9far was an Arabic podcast discussing scientific topics
- Researched material, produced scripts, and co-presenting episodes totally over 20 hours of content.

Skills

- **Programming Languages:** C/C++, Python, Unix systems, and Snakemake
- **Human Languages:** Arabic (native), English (fluent), Turkish (basic), Portuguese (basic)
- **Others:** Public speaking and communication, academic writing, teamwork