

CURRICULUM VITAE

Personal information

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Nationality: **Jordanian**

Date of birth: **09 / 04 / 1983**

Gender: **Male**

Professional career mission statement

My professional mission is to impart knowledge and education meaningfully by integrating rigorous academics, research excellence, and impactful teaching practices. As an educator, I commit to fostering an inclusive and engaging learning atmosphere where students are equipped with the essential theoretical foundations and inspired to cultivate critical thinking, creativity, and a passion for lifelong learning. My objective is to actively contribute to the corpus of knowledge within my field, seeking innovative solutions to complex problems and pushing the boundaries of understanding. By combining my dedication to academic excellence with a commitment to effective teaching methodologies, I aspire to empower the next generation of thinkers, instilling in them the skills and knowledge necessary for success in their academic pursuits and beyond.

Research area

My research interests centre on clinical and biomedical data, with a primary focus on health data science and its goal of elucidating the complex genotype-phenotype associations underlying variations in diseases and traits. I am dedicated to developing novel disease/trait detection methods utilising high-throughput data (e.g., genomic-wide and clinical data), addressing the challenge of integrating heterogeneous biological datasets and biological networks and representations to discern relationships associated with the biological processes under investigation. A prevalent issue in bioinformatics and other biomedical sciences involves harmonising large, multimodal data for effective analysis. I am particularly interested in standardising and representing biomedical knowledge to create robust frameworks that fully comprehend complex biological data. In addition, I am passionate about advancing integration and interoperability in healthcare data systems. Exploring the applications of artificial intelligence (AI) and machine learning (ML), multiomics, and multimodal integrative analytics, my research aims to leverage advanced analytical techniques for meaningful insights from extensive datasets. The utilisation of big datasets is fundamental to my research approach, contributing to advancements in understanding the genotype-phenotype relationships and biological processes associated with diseases and traits within and across species.

Education

1. Aberystwyth University, Aberystwyth, Wales, UK
PhD in Computer Science – Bioinformatics and Computational Biology – November 2023.
2. Yarmouk University, Irbid, Jordan
Master's degree in information technology and computer Sciences - 2010/2011. **GPA:** 81.5% Very Good
3. Jordan University of Science and Technology (JUST), Irbid, Jordan
Bachelor's degree in information technology, Computer Information Systems (CIS) – 2007/2008.
GPA: 83.1% Very Good

Work experience(s)

1. Instructor at Collage of Applied Studies and Continuing Education – Computer Science Department – Albaha University – Kingdom of Saudi Arabia from December 2011 – until June 2013.
2. Teacher Assistant at Yarmouk University in the second semester 2008/2009.
3. Teacher Assistant at Yarmouk University in the first semester 2009/2010.
4. Computer Instructor, Jordan Ministry of Education, Second session 2005/2006.

Conference(s)

1. Student Conference on Mathematical Foundations in Bioinformatics (MatBio), Department of Informatics, King's College London, London, UK, August 2018.
2. 3rd UK Bioinformatics Student Symposium, Aberystwyth University, August 2017.

Scholarship(s)

1. Partial scholarship (2nd and 3rd years of my PhD). Computer Science Department, Aberystwyth University, Wales, UK.

Poster(s)

1. **Eslam Al-Hersh**, Prof. John Doonan, Dr. Anyela Camargo-Rodriguez, Prof. Georgios Gkoutos, & Dr. Chuan Lu. "Gene Prioritisation by Combining GWAS Data and Biological Networks using GeneRank Algorithm in Plants", 3rd UK Bioinformatics Student Symposium, Aberystwyth University, Wales, August 2017, UK.
2. **Eslam Al-Hersh**, Prof. John Doonan, Dr. Anyela Camargo-Rodriguez, Prof. Georgios Gkoutos, & Dr. Chuan Lu. "Utilising Machine Learning Techniques for Predicting Causal Genes of Traits Variations in Plants using Genome-wide Data", Public Engagement Day, Aberystwyth University, Wales, June 2016, UK.

Workshop(s)

1. Intel AI workshop- about machine learning and deep learning fundamentals, Aberystwyth University, November 2017.
2. 5th Aberystwyth Bioinformatics Workshop, Jan 2017.
3. European Bioinformatics Institute (EBI) workshop - Exploring Plant Variation Data. Cambridge, July 2015.
4. 2nd Aberystwyth Bioinformatics Workshop, June 2015.

Courses taught

I taught various courses in Computer Science. They are:

- **Theory of computation (Introduction to Automata):**

The theory of computation, a fundamental part of computer science and information technology, investigates the capabilities and limitations of computational devices. It provides a framework for understanding algorithms and computability boundaries. It shapes the theoretical foundations of computer science and offers practical insights into algorithm development and system design. I taught several topics of computational theory, including regular languages, characterised by regular expressions and finite automata (deterministic finite automaton; DFA and NFA; nondeterministic finite automaton; NFA), non-regular languages require more sophisticated computational models, such as Alan Turing machine, the pumping lemma which systematically evaluate regularity or non-regular traits, contributing to a broader understanding of computational limits and capabilities. Finally, an introduction to Push-down automata (PDA) extends the expressive power of computational models by incorporating a stack-like memory structure.

- **Data structures and program design using C++:**

Data structures are essential in computer science, providing a systematic approach to managing, storing, and retrieving data. They are the foundation for well-designed algorithms and are crucial for maximising the performance of computer programs. They come in various forms, from simple arrays to complex structures like trees and graphs. Understanding data structures is crucial for software development, as it facilitates the creation of dependable and effective applications across various computer science fields.

C++ provides a wide range of building blocks for working with data structures, including the stack, queue, list, doubly linked list, and linked list building blocks. The stack is a Last-In-First-Out (LIFO) structure, facilitating quick and controlled access to data items. The queue, a First-In-First-Out (FIFO) structure, is required for processes like job scheduling and breadth-first search engines. The list is a dynamic, adaptable framework that enables creating and manipulating groups with various piece sizes. Linked lists connect entries by pointers, making insertion and deletion operations more efficient. Linked queues and stacks maximise space and time complexity in scenarios where dynamic resizing happens regularly. The implementation of these structures uses C++ object-oriented paradigm components, such as pointers and classes, which provide code organisation and modularity. Combining these building blocks allows programmers to create generic data structures that accommodate a wide range of data types, improving code reuse and flexibility.

- **Introduction to multimedia:**

Multimedia in computer science involves integrating various media forms like text, graphics, audio, video, and animation to create interactive digital content. It impacts areas like web development, gaming, virtual reality, education, and entertainment. Understanding multimedia involves algorithms, data formats, streaming technologies, and user interface design.

- **Introduction to information retrieval (IR):**

IR in computer science is a field that develops algorithms and methodologies to efficiently locate relevant information from vast datasets. It aims to optimise precision and recall, ensuring comprehensive and relevant content. As digital information volume grows, IR plays a crucial role in various domains, including search engines and academic databases.

- **Special topics – introduction to Linux/Unix operating systems commands:**

For system administrators, developers, and anybody else working in a command-line environment, being familiar with the commands of the Linux/Unix operating system is an essential skill in computer science. Consistently reliable and adaptable, Linux/Unix provides an effective command-line interface that lets users communicate with the system via a set of instructions. These commands cover numerous activities, including text processing, system administration, file and directory manipulation (e.g., sudo, systemctl), and more (e.g., grep, awk, sed, and vi). To navigate the system, handle files, automate tasks, and regulate processes with efficiency, one must comprehend and become proficient with these commands. Additionally, the ability to script in Linux/Unix, frequently with Bash, enables users to design robust and intricate workflows, making it an essential competency for managing systems and developing software in a variety of computing contexts.

- **Introduction to database management systems (DBMS) – MS Access (for diploma students):**

Microsoft Access is an intuitive and adaptable tool for storing and organising data. It is a relational database management system (DBMS). A graphical interface offered by MS Access, a component of the Microsoft Office suite, enables users to build, edit, and interact with databases without the need for advanced programming skills. Because it uses a relational paradigm, associations between tables can be established to preserve data integrity and make complex queries easier to execute. Forms and reports may be created with MS Access, which improves the user interface and makes it possible to show data in an understandable way. With capabilities like data validation, query optimisation, and integration with other Microsoft Office apps, it's a great option for small to medium-sized projects. MS Access is an approachable starting point for people and companies looking for practical database management system for their data storage and retrieval needs, even though it might not scale as effectively as enterprise-level DBMS systems.

- **Introduction to C++ programming language:**

C++ stands out as a robust and widely recognised programming language, valued for its efficiency and versatility. It empowers programmers to create scalable and dependable programs with a broad spectrum of features covered in my C++ lessons. These encompass essential data types such as characters, integers, floating-point numbers, and comprehensive control structures like loops, switch statements, and if statements. Logical operators, arrays for systematic data storage and manipulation, and object-oriented programming (OOP) principles like modularity and encapsulation were also addressed and implemented through techniques such as classes and structs. Finally, pointers, crucial for memory manipulation, were studied providing an avenue for efficient data handling and direct access to memory locations. The teaching approach integrates foundational principles, assignments, and real-world implementations to comprehensively understand each C++ feature.

Personal skills

Mother tongue(s): Arabic.

Other language(s): English.

Social skills: I utterly comprehend the importance of processing effective communication skills both within and outside a professional setting for the purpose of knowledge transfer.

Organisational skills: I am self-motivated, hardworking, team-working, self-learning and eager to learn more.

Technical skills:

1. Client-side (Front-end) web development: XHTML, HTML, CSS, and JavaScript.
2. Server-side (Back-end) web development: PHP.
3. Database Management Systems: Advanced Access 2019 and MySQL.
4. Object Oriented Methodologies (Modeling Languages): Unified Modeling Language (UML).
5. Modeling Tools: Rational Rose.
6. Multimedia Software: Adobe Photoshop CS5 and Adobe Illustrator CS5.
7. Statistical-based programming language: R.
8. General purpose programming languages: Visual Basic, C++, Java, and Python. Also, I can learn any new programming language if required to do so.