

# ADEL MOUNZER SALEH

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Nationality: Lebanese

Date Of Birth: 29 February 1992

Sex: Male

"Nobody ever figures out what life is all about, and it doesn't matter. Explore the world. Nearly everything is really interesting if you go into it deeply enough." - *Richard P. Feynman*

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## About Self

A curious and analytical person who seeks innovation and creativity. I enjoy tackling difficult problems from different perspectives with focus on intuition and simplicity, without compromising precision and rigor, and (whenever possible) provide a visualization or simulation to the solution. I take delight in coming up with new approaches to solve old problems, with the hope of obtaining tools to tackle the unresolved ones. I investigate connections between the many fields of Mathematics and rely on Physics and Computer Science for intuition. I actively develop my communication skills to relay information in the simplest and most interesting way possible.

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## EDUCATION

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### American University of Beirut (AUB)

#### Masters in Mathematics

Jan 2018 - May 2020

Masters Thesis: *Existence and Simulation of Solutions to the 2D Hasegawa–Mima Equation with Periodic Boundary Conditions*

#### Bachelor of Science in Mathematics

May 2017

#### Minor in Computer Science

Lebanese Baccalaureate in General Sciences  
Collège Louise Wegman

August 2010

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## RESEARCH INTERESTS

- Functional Analysis and PDE's. Galerkin methods in non-linear PDEs. Stochastic methods for solving PDE's. Numerical Simulation of PDE's.
- Topological Graph Theory. Connections between algebraic geometry/topology and graph theory. Application of the *Polynomial Method* in graph problems.

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## PROFESSIONAL EXPERIENCE

### Graduate Assistant at American University of Beirut

Feb 2018 - Present

Assisted in teaching Statistics, Measure Theory, Topology and Numerical Analysis.

### Math Teacher at Elite Tutors: Lebanese International Academy

Sept 2017 - Present

I tutor university level math courses such as calculus (III and IV), introduction to analysis, topology, linear algebra and differential equations.  
<http://elitetutors.org/>

### Attending 1ère École de la Physique du Plasma et de la Fusion dans la Région MENA

Feb 2020

Intensive course on plasma physics and magnetic confinement fusion. This course is taught in the form of conferences by experts in the field of plasma and fusion from France, Tunisia and various countries in the MENA region. <https://sites.google.com/view/mpfus2020/>

## PROJECTS and PUBLICATIONS

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### Braquet and the MG-QTM Simulator

June 2015 - Present

An ambitious project aimed at simulating MG-QTMs, a generalization of Stationary Rotational Quantum Turing Machines (SR-QTMs). It started out as a final year project for George Zakhour (see <https://github.com/geezee>) and is kept under occasional maintenance. I am responsible for developing and maintaining the Arithmetic Logic Unit (ALU) of Quantum Virtual Machine (QVM for short) which simulates these QTM's. <https://github.com/adelsaleh/qvm>

### Hasegawa-Mima Equation with Periodic Boundary Conditions

Jan 2020 - Present

As part of my thesis, I do finite element simulation of the Hasegawa-Mima equation using the software FreeFem++. <https://github.com/adelsaleh/hmSimulator>

### Redink

May 2014

Along with Bayan Rafeh and George Zakhour we developed Redink, a desktop application for the AUB English Department. The application parses novels for locations and builds word clouds associated with each location. <https://github.com/adelsaleh/red-ink>

## COMPUTER SKILLS

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Operating Systems	GNU/Linux and Windows.
Languages	C, C++ D, Java, Javascript, PHP, Python.
Markup and Scripting	Bash, CSS, HTML, L <sup>A</sup> T <sub>E</sub> X, and markdown.
Database	SQL.
Frameworks	Flask, Processing, and familiar with AngularJS.
Tools	Git and Vim.
Software	Matlab, Octave and FreeFem++.

## LANGUAGES

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- English: Fluent
- French: Fluent
- Arabic: Native

## EXTRA CURRICULAR WORK

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### AUB Free Software Club, Founding Member

Fall 2013

AUB Free Software Club aimed to raise awareness about Free Software and specifically the GNU/Linux OS through the organization of workshops and talks about privacy and security. The club currently is inactive.

### L<sup>A</sup>T<sub>E</sub>X Workshop

March 2014

Alongside Ma3bar and the Computer Science Department at the American University of Beirut, the Free Software Club through myself gave a 4-hour long workshop about L<sup>A</sup>T<sub>E</sub>X.

### AUB Outdoors

Outdoors is one of the largest student-run events in Lebanon and the Middle East attracting over 20,000 people every year. I performed four times (in 2012, 2013, 2014 and 2017) with several bands.

**Hobbies** I'm a self-taught Guitar, Mandolin, Drums and Harmonica player. Chess medalist in high school. Currently learning Snooker.