Ahmed Shalabi

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Education

2015 – Present **Candidate for Bachelor of Science in Mathematical Physics**
University of Waterloo
Department of Physics and Astronomy

Research Experience

Honours Research Project
University of Waterloo
Department of Physics and Astronomy — September 2019 – Current

Research in Relativistic quantum information and entanglement harvesting with Dr. Robert Mann. In particular, my work involved showing that the no go theorem for delta switching holds in cavities in flat space time and thus holds for conformally flat spacetimes. Then for the winter term, I used the formalism of entanglement harvesting to calculate transition probabilities of qubits in $2+1$ Anti-deSitter space coupled to the vacuum through delta switching

Research Assistant
University of Waterloo
Institute of Quantum Computing — May 2019 – September 2019

Research in quantum computation with trapped ions and open quantum dynamics in Dr. Senko's lab in the IQC. Designed and helped align mechanical parts for the 24 W laser for Raman transitions in the group's ion trap. Numerically simulated and quantified the impact of the heating of the phonon modes of the linear chain of ions in the trap on the fidelity of the group's proposed 2 qudit entangling gate.

Research Assistant
University of Waterloo
Department of Applied Mathematics — September 2018 – December 2018

Research in electrochemistry and nanophysics of Graphene based FET sensors with Dr. Miskovic in the Applied Math Department. numerically studied the effects of Dielectric saturation and decrement in electrolytes on the electrochemistry of metallic and Graphene conductors. Developed and implemented a computational procedure to calculate the differential capacitance of Graphene based chemical FET sensors in ionic liquid electrolytes.

Research Analyst
The Hospital for Sick Children
Department of Diagnostic Imaging — January 2018 – April 2018

Research and software development for medical research for the department of diagnostic imaging at Sick Kids. Developed a Matlab pipeline for the segmentation and separation of visceral and subcutaneous fat in abdominal CT images for research into pediatric fatty liver disease and hepatic steaosis. Researched, developed and did statistical analysis on a new segmentation method in Matlab for volume quantification of Wilms tumor in CT images using Level Set Methods for research into the response of the tumor to therapy protocols.

Research Assistant/Bioinformatician
CENTER FOR ADDICTION AND MENTAL HEALTH
KREMBIL FAMILY EPIGENETICS LABORATORY SEPTEMBER 2017 – DECEMBER 2017

Research and data analysis on Epigenomic sequencing results for the Krembil Family research group in CAMH. Implemented an analysis pipeline to efficiently study the concentrations of dominant sequences in Bisulfite Epigenomic data. Conducted a statistical analysis on the effects and the behavior of the current PCR deduplication method in the methylation pipeline to discover hypo-methelyation artifacts in the group's sequencing runs.

AWARDS & SCHOLARSHIPS

2016-2019 **Dean's Honour List**
Awarded for 80% Term average

2015 **President's Distinction Scholarship**
Awarded for 95% + Entrance Average

PUBLICATIONS

Published

FEBRUARY 2020 *Volumetric assessment of unaffected parenchyma and Wilms' tumours: analysis of response to chemotherapy and surgery using a semi-automated segmentation algorithm in children with renal neoplasms.*
Rickard M, Fernandez N, Blais AS, **Shalabi A**, Amirabadi A, Traubici J, Lee W, Gleason J, Brzezinski J, Lorenzo AJ.

JULY 2019 *Differential capacitance of ionic liquid interface with graphene: The effects of correlation and finite size of ions*
A.Shalabi, L.Daniels, M.Scott, Z.Miskovic

SEPTEMBER 2018 *Hepatic steatosis is highly prevalent across the paediatric age spectrum, including in preschool age children*
J Dhaliwal, GB Chavhan, E Lurz, **A Shalabi**, N Yuen, B Williams, I Martincevic, A Amirabadi, PW Wales, W Lee, SC Ling, M Mouzaki

CONFERENCE PRESENTATIONS

AUGUST 2019 *AMMCS 2019 at Wilfred Laurier University, Waterloo ON, Canada*
Differential Capacitance of Ionic Liquid Interface with Graphene

COMPUTATIONAL SKILLS

LANGUAGES	Python, MATLAB, Mathematica, R, PERL
SOFTWARE AND TOOLS	Linux, Bash, Git, LaTeX
CONCEPTS	Computational Physics, Data Analysis, Unsupervised learning, Neural Networks