Fatimah Ahmadi
Januray 2019

PERSONAL DETAILS

Name	Fatimah Ahmadi
Address	St. Edmund Hall, Queen Ln, Oxford
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EDUCATION

University of Oxford — Jan 2017 - Present
Department of Computer Science, Quantum Group
DPhil Student in Quantum Computing

Sharif University of Technology — Sep 2012 - Jan 2015
Department of Physics, Quantum Group
Master of Science in Physics, Total GPA: 18.34/20
Thesis: Introduction to Categorical Aspects of Topological Quantum Computation

Shahid Beheshti University — Sep 2008 - June 2012
Department of Physics
Bachelor of Science in Physics,Total GPA: 17.2/20
Final Project: Study Fecund Universes

RESEARCH INTERESTS

• **Quantum Computation**
Particularly, topological quantum computation and especially doing computation with defects.

• **Category Theory in Physics**
Particularly, module categories and bicategories to describe defects and boundary conditions in topological models.

• **Machine Learning in Physics**
Despite the lack of my expertise, I have become recently interested in machine learning techniques in physics.

HONOURS AND GRANTS

M. Sc. Rank — Jan 2015

3rd in the class among 33 graduates of master in physics admitted in 2012.

M. Sc. Admission Sep 2012

Accepted as an M.Sc. candidate in physics, Sharif University of Technology, without an entrance exam as an **exceptional talented student** (Master admission is through a national entrance exam in Iran).

B. Sc. Rank Jun 2012

2nd in the class among around 30 graduates of bachelor in physics admitted in 2008.

RELEVANT TRAININGS

Category, Proof and Process Michaelmas 2019

CS Department— University of Oxford —Grade: 74/100

Special Topics in Field Theory Spring 2014

Physics Department — SUT — Grade: 18.9/20

Critical Phenomena Fall 2013

Physics Department — SUT — Grade: 19/20

Quantum Information Spring 2012

Physics Department — SUT — Grade: 18.6/20

Advanced Mathematical Physics Spring 2012

Physics Department — SUT — Grade: 19.5/20

TEACHING EXPERIENCE — UK

Tutor of Quantum Mechanics Jan 2019-Present

Mansfield College — University of Oxford

Tutor of Categorical Quantum Mechanics Jan 2019-Present

Department of Computer Science — University of Oxford

Tutor of Category Thoery Oct 2018-Dec 2018

Department of Computer Science — University of Oxford

Tutor of Topological Quantum Matter Oct 2018-Jan 2019

Department of Physics— University of Oxford

ADMINISTRATIVE AND VOLUNTEER EXPERIENCE — UK

Conference Organiser June 2017-Present

5th and 6th versions of Oxbridge women in computer science conference

Oxford Women in Computer Science Society (OxWocs)

Local Organiser April 2019

3rd Symposium on Compositional Structures (SYCO 3)
University of Oxford

Local Organiser Sep 2017

FSCD 2017
University of Oxford

Student Mentor Summer 2018

in2Science UK Programme
University of Oxford

IoP Campus Ambassador Job Offer 2018

Could not take the role due to my visa type.

Outreach June 2017 and Apr, June, Aug 2018

Quantum Physics Workshop
University of Oxford

SKILLS

Languages	Farsi (mother tongue)—English (fluent)
Software	Mathematica(familiar), LaTeX, Python(familiar) HTML(familiar)

OTHER TRAININGS

Teaching in Mathematical Subjects Workshop Oct 2018

Mathematics Institute, University of Oxford

Anti Bullying and Anti-Harassment Workshop Oct 2018

Physics Department, University of Oxford

Bridge to Business 25 - 28 Sep

St. Edmund Hall, University of Oxford

Broadly speaking I am interested in economics and finance, so I attended this four-day intense programme on the basics of business and finance. During the course, we had two lectures on the fundamental of finance by Prof. Mark Shackleton.

0.1 Relevant Projects/Courses

Research Projects:

- My master thesis was on **categorical aspects of topological quantum computation**. Although that was not an original work, I tried to connect axiomatic model of topological quantum computation to fusion categories and fill the gap wherever there was not any explicit mention in physics literature.

- Basic data of 2-category of module categories over a fusion category (a work in progress)

- Additive structure in 2-categories (a work in progress)

Relevant Courses:

- Category, Proof and Process

- Categorical Quantum Mechanics

0.2 The date you completed or expect to complete your Ph.D

17th July 2020

0.3 Order of project preference

1. Miriam Backens: Simplifying quantum circuits using the ZX-calculus

2. Pieter Hofstra: Complexity classes, computation, and Turing categories

3. David Spivak: Toward a mathematical foundation for autopoiesis

4. Tobias Fritz: Partial evaluations

5. Mehrnoosh Sadrzadeh: Formal and experimental methods to reason about dialogue and discourse using categorical models of vector spaces

6. Bartosz Milewski: Traversal optics and profunctors

0.4 To what extent can you commit to coming to Oxford

I will be in Oxford then.

1 Statement

I am doing a DPhil in quantum group at University of Oxford. My main interest is in applications of category theory more in algebraic sense in topological quantum computation and condensed matter physics. Recently, I have been working on additvity structure of 2-categories. However, I am interested also in learning more about other applications, especially in quantum and classical computation.

Doing a project in this workshop, I will be able to broaden my knowledge not only on category theory but also on other topics to which these projects are related. Since my main plan after finishing DPhil is staying in academia, this is also an invaluable opportunity for me to work with other distinguished researchers.