

Widad Dabbas

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Education

Durham University

MSc in Mathematical Sciences

Durham, UK

September 2024 - Present

- **Working Title:** Soil microbiome complexity-stability theory supported by RMT and novel metagenomic ML methods

Ecoversity

Permaculture Design Certification

Remote, Punta Mona, Costa Rica

October 2023 - May 2024

- **Design Project Leader**

University of St Andrews

BSc in Biology and Mathematics with Honours

St Andrews, UK

Sept 2019 - June 2023

- **Biology Dissertation:** Disturbance and Niche Construction as Mechanisms of Community Assembly
- **Mathematics Dissertation:** Distinguishing knots with category theory

Amman Bacalaureate School

International Bacalaureate Diploma Programme

Amman, Jordan

August 2016 - June 2018

Experience

Soul Curated Wellness

Regenerative Design Consultant

Amman, Jordan

January - August 2024

- Conducted thorough site analyses using historical data and on-site field surveys.
- Mapped local ecosystem processes to predict optimal mutualistic design opportunities.
- Led a team of 4 to produce a comprehensive master-plan including presentation, realistic timeline and budget.
- **Skills:** Architectural Diagramming, Proposal Preparation, Project Scoping, Site Analysis, 3D modeling

Control Theory and Systems Biology Lab, ETH Zurich

Visiting Student

Basel, Switzerland

August - September 2022

- Used MATLAB to simulate controllers in discrete chemical reaction networks.
- Assisted in molecular cloning to construct the theorised biological controllers in yeast cells.
- Investigated the dynamical properties of initial simulated networks and subsequently constructed controllers.
- **Skills:** Control Systems, Dynamical Systems Analysis, Matlab, Molecular Cloning, Synthetic Biology, Numerical Optimisation

St Andrews University Kendo Club

Safety Officer

St Andrews, UK

May 2022 - June 2023

- Conducted a complete, up to date risk assessment and maintained first aid kit inventory.
- Improved safe training conditions, prepared for a regional event, and provided first aid when necessary.
- **Skills:** Documentation, First aid, Risk Assessment

Royal Botanic Garden

Assistant Botanist

Balqa, Jordan

January - June 2022

- Trained across all research departments then continued as an assistant of agricultural engineering.
- Preserved seed bank and herbarium specimens whilst maintaining irisBG GIS population databases.
- **Skills:** Archival Preservation, Sampling, Plant Care, Sediment Preparation, Seed & Vegetative Propagation, Species Identification

Kalila wa Dimna Publishing

Book Illustrator

Amman, Jordan

July 2019 - August 2020

- Completed 10 unique watercolour illustrations.
- Captured plot, emotions and themes within watercolour illustration.
- **Skills:** Abstraction, Photoshop, Visual Communication, Watercolour Illustration

Girguis Lab for Ecophysiology, Biogeochemistry and Engineering, Harvard

Laboratory Intern

Cambridge, MA, USA

September - December 2018

- Independently constructed an OpenROV and used it to gather underwater footage in the Gulf of Aqaba.
- Collaborated on a video research proposal as a director, editor and translator, making use of ROV footage.
- Shadowed PhD research on *Sporomusa ovata*, and was responsible for treating and managing anaerobic liquid cultures.
- **Skills:** Anaerobic Microbiology, Electrical Wiring, Housing Construction, Proposal Preparation, Videography

Jackson Hole Science Media Awards at WGBH

Event Assistant

Boston, MA, USA

October 2018

- Assisted in running the Jackson Hole Science Media Awards and Summit at WGBH.
- Provided onsite event support, including catering, ushering and sound system support.
- Worked closely with the event management team to prepare the venue and delegate skill based tasks.
- Ran tours of virtual and augmented reality systems after learning the new technologies, their functioning and uses.

Ocean Exploration Trust, E/V Nautilus

Pacific Ocean, CA, USA

Science/Data Team and Video Engineer

July - August 2017

- Remotely operated the 23 live broadcast cameras on ROVs Hercules and ARGUS and aboard the E/V Nautilus.
- Engaged in live radio discussion and analysis of underwater footage with the science team.
- Prepared deep sea samples in the onboard wet lab for further use by onshore researchers.
- **Skills:** Audio Engineering, Sample Preparation, Science Communication, Video Engineering

Learning Trail Nursery

Amman, Jordan

Summer School Teacher

June 2014 - June 2017

- Planned and led art lessons.
- Responsibly managed groups of children at 5-10 years of age.
- Took initiative and creativity in problem solving, conflict resolution and engaging teaching.

Projects

Earth's Whispers: Solo Exhibition

Amman, Jordan

Jordan National Gallery of Fine Arts

August 2024

- Successfully curated my debut solo exhibition as a first example of integrating science communication with fine arts in Jordan. Inspired by the wonders of soil as a vital ecosystem and an impressive natural material, I experimented with the dichotomy of modern glass prints supported by handmade adobe sculptures. Brief microbial and structural analysis was also conducted in collaboration with professors at the University of Jordan to produce a complimentary educational film.
- **Skills:** Creativity, Electron Microscopy, Mud and Gypsum Prep, Photography, Science Communication, Soil Microbiology, Videography.

Financial Time Series Topological Data Analysis (TDA)

Aalborg, Denmark

Aalborg University

June 2023

- Investigated and presented on the predictive capabilities of TDA inancial market conditions using financial time series data as part of the Danish-Swedish summer school on Topological Data Analysis and spatial statistics. Methods were adopted from the literature to analyse three financial time series of NVDA, WMT and XOM stock prices over the last 20 years. Interpreted TDA analyses with reference to financial and historical records whilst learning and using TDA libraries in Python. Presented findings in a conference setting. No conclusive results were made, but persistent entropy appeared to be negatively correlated with market volatility.
- **Skills:** Python (giotto-tda,scikit-tda), Spatial Statistics, Time Series Analysis, Topological Data Analysis.

Experimental Research Project: Ecological Niche Construction

St Andrews, UK

University of St Andrews

September 2022 - April 2023

- Conducted research into the effects of ecological niche construction under various disturbance regimes under climate change and severe weather events as my biology dissertation. Research was primarily conducted by computational methods adapted from the literature. Links were then drawn between a defined ecological model and the existing knowledge and data from with coral reef ecosystems in mind.
- **Skills:** Dynamical Systems Analysis, Ecological Modeling, MATLAB, R.

Project in Pure Mathematics: Knot invariants and Categorification

St Andrews, UK

University of St Andrews

September 2022 - April 2023

- Authored a dissertation walking through the use of categorification in knot theory. Independent study of category theory, homological algebra and knot theory was undertaken. Care was taken to break down and introduce complex topics to the reader through written or visual communication. A strong narrative was achieved and carried through technical definitions and reconstructed proofs.
- **Skills:** InkScape, $\text{\LaTeX}$ (XY-pic), Technical Writing, Wolfram Mathematica.

Intertidal Project on *Ascopylum nodosum*

St Andrews, UK

University of St Andrews

August - September 2023

- Designed and conducted an observational study relating *A. nodosum* length to shoreline elevation. Line-intercept sampling was implemented to collect data. ANOVA and Akaike information criterion (AIC) were applied in R for data and statistical analyses. Results negatively correlated *A. nodosum* length with shoreline elevation irrespective of age. Limitations and explanations were discussed.
- **Skills:** Line-Intercept Sampling, R, Statistical Data Analysis.

Skills

Programming

CSS, HTML, MATLAB, Python (Pandas,NumPy,Scikit-TDA), R (ggplot2,desolve), Wolfram Mathematica

Analytical

Experimental Design, Dynamical Systems Modeling/Analysis, Statistical Data Analysis, Time Series, Topological Data Analysis

Practical

Audio-Video Engineering, Electrical Wiring, Field Research, First Aid, Lab Skills, Microscopy, Species Identification, Synthetic Biology

Miscellaneous

Adobe, Blender, Diving (Free/SCUBA), Driving License, Illustration, $\text{\LaTeX}$ (Overleaf/R Markdown/XY-pic), Microsoft Office, Technical Writing

Soft Skills

Curiosity, Communication, Diagramming, Documentation, Engaging Presentation, Logic, Problem-solving, Teamwork