

# Mohammed Alsobay

✉ mosobay@mit.edu

☎ (+1) 617-710-7032

🌐 <https://www.malsobay.com/>

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## RESEARCH INTERESTS

- Computational social science
- Collective intelligence
- Human-AI interaction
- Machine learning

## EDUCATION

**Massachusetts Institute of Technology**, Cambridge, MA 2020–2025 (expected)  
Ph.D. Candidate, Information Technology

- *Advisor*: Prof. Abdullah Almaatouq
- *Selected coursework*: Econometrics, Microeconomics, Game Theory, Machine Learning, Machine Learning for Causal Inference, Computational Cognitive Science, Principles of Rationality and Irrationality, Computational Models in Social and Behavioral Sciences

**King Abdullah University of Science and Technology**, Thuwal, Saudi Arabia 2017  
M.S., Applied Mathematics and Computational Science

- *Selected coursework*: Probability & Random Processes, Linear Models, Numerical Optimization, Spatial Statistics

**Massachusetts Institute of Technology**, Cambridge, MA 2016  
B.S., Chemical Engineering (minor in Energy Studies)

## RESEARCH EXPERIENCE

**MIT Center for Collective Intelligence**  
*Researcher* Sept 2020 - Current

- Exploring how people and computers can be connected so that—collectively—they act more intelligently than any person, group, or computer

**Empirica (Open-source Software for Virtual Labs [[link](#)])**  
*Researcher, Core Contributor, and Community Manager* Sept 2020 - Current

- Integrate researcher feedback (29+ different teams across 17 institutions since 2020) and primary research on digital experimentation into product roadmap
- Incorporate concepts of adaptive experiment design, such as Bayesian optimization, into the platform
- Created and currently manages the Empirica Developer Network and community spotlight blog

**Doyle Lab (MIT)** Cambridge, MA  
*Undergraduate Researcher - Energy Engineering Projects Lab* Feb - May 2015

- Designed and executed experiments investigating nanoemulsion formation and stability, and presented findings to an audience of 50+

**Strano Lab (MIT)** Cambridge, MA  
*Undergraduate Researcher* Sept - Dec 2014

- Designed and executed an experiment to investigate propagation of 2-D thermopower waves

**Reacting Gas Dynamics Lab (MIT)** Cambridge, MA  
*Undergraduate Researcher* Jun - Sept 2013

- Developed a control panel in MATLAB to automate gas flow for experiments in a chemical-looping combustion reactor

## PUBLICATIONS

- Abdullah Almaatouq, **Mohammed Alsobay**, Ming Yin, Duncan J. Watts. “The Effects of Group Composition and Dynamics on Collective Problem-Solving” [**Under review**]
- Abdullah Almaatouq, **Mohammed Alsobay**, Ming Yin, Duncan J. Watts. “Task Complexity Moderates Group Synergy”. *Proceedings of the National Academy of Sciences*, 2021.

RESEARCH IN PROGRESS	<ul style="list-style-type: none"> <li>● <b>The effect of social dynamics on private use of algorithmic decision support</b> with Abdullah Almaatouq</li> <li>● <b>Exploring the effect of punishment on prosocial behavior across contexts using adaptive experiment design</b> with Abdullah Almaatouq, David G. Rand, and Duncan J. Watts</li> <li>● <b>Improving group decision-making and deliberation for contentious topics</b> with Abdullah Almaatouq, Michael N. Stagnaro, and David G. Rand</li> <li>● <b>The determinants of computational and human-experienced complexity in constraint satisfaction &amp; optimization problems</b> with Nak Won Rim, Abdullah Almaatouq, Ming Yin, and Duncan J. Watts</li> </ul>	
RESEARCH FEATURED IN MEDIA	<ul style="list-style-type: none"> <li>● <b>Is teamwork always the most effective way to complete tasks?</b> World Economic Forum, 2021 <a href="#">[link]</a></li> <li>● <b>When two heads aren't better than one</b> MIT Sloan School of Management News, 2021 <a href="#">[link]</a></li> <li>● <b>Which tasks are best for teams and which should be tackled solo?</b> Quartz (Op-Ed), 2021 <a href="#">[link]</a></li> </ul>	
TALKS & TUTORIALS	<ul style="list-style-type: none"> <li>● <b>Measuring Belief Systems in Networked Communities (Princeton University, 2022)</b> “Integrative, High-throughput Experimentation to Explore Social Cooperation”</li> <li>● <b>8<sup>th</sup> International Conference on Computational Social Science (IC<sup>2</sup>S<sup>2</sup> 2022)</b> Tutorial on “Computational Social Science Tools for High-throughput Digital Experimentation”</li> <li>● <b>MIT Conference on Digital Experimentation (CODE 2021)</b> “Collective Problem-Solving of Groups Across Tasks of Varying Complexity”</li> <li>● <b>MIT Computational Social Science Lunch (10/2021)</b> “Collective Intelligence Across Tasks of Varying Complexity”</li> <li>● <b>PyData Riyadh (07/2021)</b> “Adaptive Data Collection”</li> </ul>	
TEACHING EXPERIENCE	<ul style="list-style-type: none"> <li>● <b>Graduate Teaching Assistant</b> <span style="float: right;">FA22</span> 15.561 Information Technology Essentials, Prof. Abdullah Almaatouq, MIT</li> <li>● <b>Analytics Lab Mentor</b> <span style="float: right;">FA22</span> 15.572 Action Learning Seminar on Analytics, Machine Learning, and The Digital Economy Profs. Abdullah Almaatouq and Sinan Aral, MIT</li> </ul>	
MENTORSHIP	<ul style="list-style-type: none"> <li>● <b>Jasmine Chen (MIT Undergraduate Research Opportunities)</b> <span style="float: right;">2022</span> <i>Project title:</i> “High-throughput Experimentation With Empirica to Explore Social Cooperation in Public Goods Games”</li> <li>● <b>Donald Liu (MIT Undergraduate Research Opportunities)</b> <span style="float: right;">2022</span> <i>Project title:</i> “Design and Deployment of an Interactive, Multiplayer Experiment to Explore Group Communication and Problem-solving”</li> </ul>	
HONORS AND AWARDS	<ul style="list-style-type: none"> <li>● <b>SACM Excellence Award</b> <span style="float: right;">2014-2016</span> 5-time awardee for academic excellence by the Saudi Arabian Cultural Mission</li> <li>● <b>King Abdullah Scholarship</b> <span style="float: right;">2012</span> A full-tuition undergraduate scholarship awarded by the Saudi Arabian Cultural Mission</li> <li>● <b>KAUST Gifted Student Program Scholar</b> <span style="float: right;">2011</span> An undergraduate living stipend awarded by KAUST to ~100 students annually</li> <li>● <b>Intel International Science and Engineering Fair Finalist</b> <span style="float: right;">2011</span></li> </ul>	

PROFESSIONAL **Mozn**  
EXPERIENCE **Senior Data Scientist**

Riyadh, Saudi Arabia  
2019–2020

- Led the development of a SaaS financial compliance product (KYC and fraud detection) utilizing Arabic NLP, with 1M+ API calls processed within 6 months of launch
- Led a team of 2 data scientists in developing a risk-based system to aid officials in deciding to inspect incoming food shipments
- Led a team of 3 to build a geospatial intelligence platform combining retail, GPS, demographic, and point-of-interest data to inform branch location selection for a multi-billion dollar business
- Established Mozn's R&D efforts in Arabic NLP and OCR by securing support internally and hiring a research-focused team

**Data Scientist**

2017–2019

- Joined as the 1<sup>st</sup> data scientist and 3<sup>rd</sup> employee; hired technical talent of varying seniority across domains, growing to 70+ employees and 4 direct reports in 2020
- Rapidly prototyped 4 data products (from raw data to web interface) in 5 months for a govt. client, replacing manual, ad-hoc operations with reliably automated systems, and establishing quantitative practices in inexperienced client teams
- Identified and validated \$9+ million annually in data-driven operational savings for a national healthcare agency

**McKinsey & Company**  
**Summer Business Analyst**

Dubai, United Arab Emirates  
May - Aug 2015

- Received a full-time return offer above standard entry level
- Analyzed market demand data to detail product strategy for a government initiative targeting 3+ million people

**Navigant Consulting**  
**Emerging Energy Technologies Analyst - MIT Externship Program**

Burlington, MA  
Jan 2015

- Conducted a 5-year financial forecast and catalogue of 750+ subsidiaries of a major manufacturer
- Built an 8760-hour model to estimate the feasibility of large-scale solar energy projects

**Schlumberger**  
**Research & Development Intern**

Dhahran, Saudi Arabia  
May - Aug 2014

- Designed and conducted experiments to investigate interfacial tension phenomena in model oils, with rotations in the commercial downhole sample testing lab and Manifa oil field

REFERENCES

**Abdullah Almaatouq**  
Douglas Drane Career Development Professor in Information Technology  
Massachusetts Institute of Technology  
Email: [amaatouq@mit.edu](mailto:amaatouq@mit.edu)  
<http://www.amaatouq.com/>

**Duncan J. Watts**  
Stevens University Professor and Penn Integrates Knowledge University Professor  
University of Pennsylvania  
Email: [djwatts@seas.upenn.edu](mailto:djwatts@seas.upenn.edu)  
<https://duncanjwatts.com/>

SKILLS &  
TRAINING

- **Languages/Frameworks/Tools:** Comfortable: Python, R, Linux, Git — Familiar: SQL, Spark, Ansible, Airflow, Docker
- **Data Science in Python:** pandas, NumPy, scikit-learn, statsmodels, Keras, Flask, Plotly/Dash, PySpark, spaCy, Ax
- **Gaussian Process Summer School (2021):** 3-day workshop organized by the University of Sheffield for researchers on the theory and practical use of Gaussian process models
- **Full Stack Deep Learning Bootcamp (2018):** 3-day program organized by industry leaders at UC Berkeley and OpenAI focused on deploying deep learning at scale