

Edmond Awad

MIT Media Lab

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Academic Positions

Massachusetts Institute of Technology, Cambridge, MA, USA. (Jun, 2017 – present)

Postdoctoral Associate

Advisor: Iyad Rahwan

Education

Massachusetts Institute of Technology, Cambridge, MA, USA. (Sep, 2015 – May, 2017)

MSc in Media Arts and Sciences. GPA: 4.9/5.0

Thesis Title: “*Moral Machine: Perception of Moral Judgment Made by Machines*”

Committee: Iyad Rahwan (Advisor), Joshua Greene, and Joshua B. Tenenbaum.

Masdar Institute (now Khalifa University), United Arab Emirates. (Sep, 2011 – Aug, 2015)

PhD in Argumentation and Multi-Agent Systems. GPA: 3.8/4.0

Thesis Title: “*Collective Judgement in Contested Domains: The Case of Conflicting Arguments*”

Committee: Iyad Rahwan (Advisor), Thomas W. Malone, Martin Caminada, and Khaled Elbassioni

Masdar Institute (now Khalifa University), United Arab Emirates. (Sep, 2009 – Aug, 2011)

MSc in Computing and Information Science. GPA: 4.0/4.0

Thesis Title: “*Learning to Share: A Study of Multi-agent Learning in Transportation Systems*”

Committee: Jacob Crandall (Advisor), Iyad Rahwan, and Zeyar Aung.

Tishreen University, Latakia, Syria (Sep, 2002 – Jun, 2007)

BSc in Informatics Eng. (Major: Information Systems and Software Eng.). GPA: 75.78%

Capstone Project: Simulation for Traffic Lights

Publications & Working Papers

E. Awad, S. Dsouza, R. Kim, J. Schulz, J. Henrich, A. Shariff, J.F. Bonnefon, I. Rahwan. *The Moral Machine Experiment (2018)*. *Nature*. 562(7729)

E. Awad*, S. Levine*, M. Kleiman-Weiner, S. Dsouza, J. B. Tenenbaum, A. Shariff, J.F. Bonnefon, I. Rahwan. *Blaming humans in autonomous vehicle accidents: Shared responsibility across levels of automation (Revise & Resubmit at Nature Human Behaviour)*.

E. Awad, S. Levine. Should We Crowdsource Ethics? (opinion piece; under review).

M. Saveski*, E. Awad*, M. Cebrian, I. Rahwan. *Did They Escape the Room? Humans and Machines Judging Groups at Face Value* (submitted to EPJ Data Science).

R. Kim, M. Kleiman-Weiner, A. Abeliuk, E. Awad, S. Dsouza, J. B. Tenenbaum, I. Rahwan. *A Computational Model of Commonsense Moral Decision Making (2018)*. Proceedings of AAAI/ACM Artificial Intelligence, Ethics and Society (AIES-18) conference (in press).

R. Noothigattu, S. Gaikwad, E. Awad, S. Dsouza, I. Rahwan, P. Ravikumar, A. Procaccia. *A voting-based system for ethical decision making (2018)*. Proceedings of Autonomous Agents and Artificial Intelligence (AAAI-18) conference (in press).

E. Awad, J.F. Bonnefon, M. Caminada, T. Malone, I. Rahwan (2017). *Experimental assessment of aggregation rules in argumentation-enabled collective intelligence*, *ACM Transactions on Internet and Technology*, 17:3.

E. Awad, M. Caminada, G. Pigozzi, M. Podlaskzweski, I. Rahwan (2017). *Pareto Optimality and Strategy Proofness in Group Argument Evaluation*, *Journal of Logic and Computation*, 27 (8): 2581–2609.

E. Awad, R. Booth, F. Tohme, I. Rahwan (2017). *Judgment Aggregation in Multi-agent Argumentation*. **Journal of Logic and Computation**. 27 (1): 227-259.

A. Alshamsi*, E. Awad* et al. (2015). *Misery Loves Company: Happiness and Communication in the City*. **EPJ Data Science** 4 (1): 1-12.

R. Booth, E. Awad and I. Rahwan (2014). *Interval Methods for Judgment Aggregation in Argumentation*. The 14th International Conference on Principles of **Knowledge Representation** and Reasoning.

Research Experience & Projects

Massachusetts Institute of Technology, Cambridge, MA, USA (Sep, 2015 – Present)
Postdoctoral Associate (Jun 2017 - Present) and Research Assistant (Sep 2015 – May 2017)

Moral Machine: *An online platform for gathering a human perspective on moral decisions made by self-driving cars. Visit at <http://moralmachine.mit.edu>* (deployed in June 2016)

- Led a team of computer scientists and psychologists from University of British Columbia, Toulouse school of Economics and MIT to design and develop the platform.
- Over 4M visitors from 233 countries/territories, and with 40M responses.
- Website covered by or mentioned in: New York Times (Op-ed by Shariff et al.), The Times, Financial Times, Business Insider, El Pais (Spanish), Repubblica (Italian), Spiegel (German), Slate, The Verge, and World Economic Forum.
- Personally interviewed in: New Scientist, Popular Mechanics, PBS NOVA (short video), Observer, SearchCIO.com, Life (Russian Channel), and Digital Trends.
- Presented at: TEDxCambridge by Iyad Rahwan (Sep 2016); IJCAI Keynote talk by Jean-Francois Bonnefon; and AAAI/ACM AI, Ethics and Society Keynote talk by Iyad Rahwan and me.
- Exhibited at: MIT Museum, Cambridge, MA, USA (since Jan 2018); the Heinz Nixdorf MuseumsForum (one of the biggest computer museums in the world), Paderborn, Germany (since Jun 2018); and “The Future of Mobility” exhibition at Cooper Hewitt in New York City (Dec 14, 2018–Mar 31, 2019).
- Led the same team in addition to two anthropologists from Harvard University in the data analysis, which involved employing Conjoint Analysis and Hierarchical Clustering.
- Paper was accepted at Nature (publication date: Nov 1st, 2018).
- Paper was covered by (and personally interviewed): Washington Post, Nature, The Guardian, The Economist, The Independent, WIRED, The Verge, BBC, ABC News, PBS, The Telegraph, New Scientist, and MIT Tech Reviews.

MyGoodness: *An online platform that aims to understand how effectively humans give to charitable donations. Visit at: <https://mygoodness.mit.edu>* (deployed in Dec 2017)

- Led a team of scientists from Harvard University and Yale University to design the platform. Work is in collaboration with *The Life You Can Save (TLYCS) Foundation*, a nonprofit organization founded by *Peter Singer*
- Over 70,000 visitors, who contributed 700,000 responses.
- Covered by MIT News

Blaming Humans in Semi-Autonomous Vehicles: A series of experimental studies.

- Co-designed experiments, ran experiments, collected data, and analyzed data in order to understand how people assign blame to humans and machines in human-machine shared-control vehicles.
- Co-led a team of psychologists, cognitive scientists and computer scientists from Harvard University, University of British Columbia, Toulouse school of Economics and MIT.

Ethical Decision Making by Machines: Two computational models I was involved in.

- With the help of scientists from the Brain and Cognitive Science Department at MIT, our team developed a computational model of moral decision making based on a hierarchical Bayesian model

- With our help, a team from CMU developed a collective system that uses Moral Machine data to uncover human preferences, and then aggregates these individual preferences into a collective general preference

Judging Groups at Face Value: A data-science study.

- Wondered (with a friend) how easy it is to judge the success of a group by just looking at them
- Together, we collected pictures of groups who had played “escape the room”, a real-life adventure game, we annotated the pictures, and tested performance of humans and algorithms judging the success of these groups

Masdar Institute (now Khalifa University), United Arab Emirates (Sep, 2009 – Aug, 2015)
Research Assistant

Opinion Aggregation: A series of theoretical and experimental studies in formal models of reasoning and argumentation.

- Theoretically introduced formal models of aggregation in contested domains and theoretically studied the limits of these models
- Designed, ran, collected data, and analyzed data for a study to experimentally investigate the mechanisms that cause people to choose one aggregation rule over another
- Work resulted in three top-tier peer-reviewed journal papers and one peer-reviewed conference paper
- Work included collaborations with logicians, computer scientists and psychologists from different institutes.

Homophily in the City. A data-science study.

- Analyzed data of communication calls and tweets, identified and statistically showed homophily in terms of happiness in urban environments
- Submitted to Telecom Italia Big Data Challenge, and made it to the list of finalist - Data Analytics Track
- Led other 6 lab members (together with another PhD student) in this work, under the supervision of the principal investigator of the lab, Iyad Rahwan.

Cooperating in Repeated Games. An algorithm.

- Developed an algorithm that outperforms competing algorithms in self-play in a two-player, two-action limited-information game.
- Was part of a Master’s thesis under the supervision of Jacob Crandall.

Teaching Experience

Massachusetts Institute of Technology, Cambridge, MA, USA. (Sep, 2015 – Present)

Course Instructor

MAS.S60 How to Build a Moral Machine (12-unit, Graduate Level).

- This fall, I am co-teaching a seminar course with the director of the Media Lab, at MIT.
- It aims to investigate the questions of ethical decision making in algorithms, and the possibility of developing machines that are capable of making moral decisions.
- As a primary instructor of the course, I drafted the syllabus, and suggested the speaker list. I am also responsible for running the class, mentoring students with their projects and I will be drafting exam questions, and co-grading the final exam and projects of students.
- Class attendance is comprised of 10-15 persons, some of which are registered for credits.

24.132 Workshop in Ethical Engineering (3-unit, Graduate Level).

- During January 2019, I am co-teaching a short workshop course with a lecturer and a PhD student at the Linguistics & Philosophy Department at MIT.
- It aims to help students learn to develop and apply a protocol for identifying and addressing ethical issues in a computer science, or other engineering project.
- The course was recently approved, and we are drafting the syllabus.

Teaching Assistant (Sep, 2015 – May, 2017)

MAS.S67 Machine Learning, Society & Autonomy (12-unit, Graduate Level).

- Held a hands-on session on Reinforcement Learning and co-graded assignments.

MAS.S63 Cooperation Machines (12-unit, Graduate Level).

- Held a hands-on session on agent-based simulations and graded assignments.

Masdar Institute (now Khalifa University), United Arab Emirates (Sep, 2009 – Aug, 2015)

Teaching Assistant

Computational Social Science (Graduate Level).

Held hands-on sessions on data analytics, drafted the final exam questions, co-graded exams and projects, held office hours, and graded assignments.

Multi-agent Systems (Graduate Level).

Co-graded exams and projects, held office hours, and graded assignments.

Design and Analysis of Algorithms (Graduate Level).

Held tutorial sessions, held office hours, and graded assignments.

Probability and Statistics (Undergraduate Level).

Held tutorial sessions, held office hours, and graded assignments.

Fundamental Maths for Computer Science (Undergraduate Level).

Held tutorial sessions, held office hours, and graded assignments.

Tishreen University, Latakia, Syria (Sep, 2007 – May, 2009)

Teaching Assistant

Artificial Intelligence (Undergraduate Level).

Held tutorial sessions, drafted the final exam questions, co-graded exams, held office hours, and graded assignments.

Programming Languages (Undergraduate Level).

Held tutorial sessions, held office hours, and graded assignments.

Numerical Analysis (Undergraduate Level).

Held tutorial sessions, held office hours, and graded assignments.

Research/ Academic Visits

Yale University, New Haven, CT, USA (Aug, 2016)

Visiting Researcher

- Experimentally investigated the effect of audience size on the tendency to use third-party punishment as a signal
- Collaborated with Jillian Jordan and David Rand at the Human Cooperation Laboratory

Massachusetts Institute of Technology, Cambridge, MA, USA (Sep, 2014 – Dec, 2014)

Visiting/Special Student

- Designed a study to experimentally investigate the mechanisms that cause people to choose one aggregation rule over another.
- Collaborated with Thomas W. Malone at Sloan Business School, MIT

University of Luxembourg, Luxembourg (May, 2013 – Aug, 2013)

Visiting Researcher

- Theoretically introduced formal models of aggregation in contested domains and theoretically studied the limits of these models
- Collaborated with Richard Booth and Martin Caminada at the Individual and Collective Reasoning Laboratory led by Leon van der Torre.

Academic Events

Symposium on Trust and Ethics of Autonomous Vehicles (STEAV) (May 31st – Jun 1st, 2018)

Role: Leading organizer & panel moderator. Participants: 80.

MIT and Harvard University, Cambridge, MA, US

Panel Participation

Conference on Digital Experimentation (Oct 26th – 27th, 2018)

Organized by MIT Initiative on Digital Economy, Cambridge, MA, USA

Audience: researchers, data scientists, economists, statisticians

Policy Regional Dialogue (Sep 10th – 11th, 2018)

Organized by Inter-American Development Bank at InterContinental Hotel, Miami, FL, USA

Audience: delegates from Central American and South American countries

Humanity + Tech (Sep 5th, 2018)

Organized by The Atlantic at MIT Media Lab, Cambridge, MA, USA

Audience: journalists, technologists, and general public

AGTech Forum AI (May 8th – 9th, 2018)

Organized by Berkman Klein Center, Harvard University, Cambridge, MA, USA

Audience: Members of State Attorney General offices, legal scholars, and lawyers.

Conference Presentations & Seminars

International Conference on Computational Social Science (IC2S2) (June, 2018)

Talk 1: *The Moral Machine Experiment*

Talk 2: *Blaming humans in autonomous vehicle accidents*

Talk 3: *Did They Escape the Room? Humans and Machines Judging Groups at Face Value*

Northwestern University, Evanston, IL, US

The Philosophy, Politics, and Economics Society (PPES) (Mar, 2018)

Invited Talk: *The Moral Machine Experiment*.

New Orleans, LA, US

AAAI/ACM Artificial Intelligence, Ethics and Society (AIES) conference (Feb, 2018)

Invited Talk: *The Moral Machine Experiment*.

New Orleans, LA, US

Seminar series at Knight Science Journalism program (Nov, 2017)

Invited Talk: *The Moral Machine Experiment*.

MIT, Cambridge, MA, US

Conference on Digital Experimentation (CODE) (Oct, 2017)

Talk: *The Moral Machine Experiment*.

MIT Sloan School of Management, Cambridge, MA, US

International Conference on Predictive Applications and APIs (PAPIs) (Oct, 2016)

Talk: *Moral Machine: Perception of Moral Judgment Made by Machines*.

Microsoft N.E.R.D, Cambridge, MA, US

International Conference on Computational Social Science (IC2S2) (June, 2016)

Talk: *Commission and Omission Decisions by Autonomous Vehicles in Moral Dilemmas*.

Northwestern University, Evanston, IL, US

Workshop on Information in Networks (WIN) (Oct, 2015)

Talk: *Misery Loves Company: Happiness and Communication in the City*.

New York University, New York, NY, US

JA4AI – Judgment Aggregation for Artificial Intelligence (May, 2014)

Talk: *Judgment Aggregation in Multi-Agent Argumentation*.

Schloss Dagstuhl, Saarbrücken, Germany

Academic Service

Reviewer

Journals: Artificial Intelligence Journal (AIJ), Transportation Research, Journal of Logic and Computation (JLC), Journal of Computer Science (JCS).

Conferences: Autonomous Agents and Artificial Intelligence (AAAI), Autonomous Agents and Multi-agent Systems (AAMAS), International Joint Conference on Artificial Intelligence (IJCAI), Cognitive Science Society (CogSci), AAAI/ACM Conference on AI, Ethics, and Society (AIES).

Industry Experience

Latakia Port Company, Latakia, Syria.

(Jun, 2008 – Aug, 2009)

Software Engineer

Supervised the process of revising and updating different sections in a computerized program (using ORACLE Developer Forms) including: Warehouses, Civil Defense, Garage, General Accounting, Safe Box, and Reviewing.

Extra-Curricular Education

Massachusetts Institute of Technology, Cambridge, MA, USA.

(Sep, 2014 – Dec, 2014)

1.204 Computer Modeling: From Human Mobility to Transp. Nets (Grade: A)

Instructor: Marta Gonzalez

Massachusetts Institute of Technology, Cambridge, MA, USA.

(Sep, 2014 – Dec, 2014)

6.436 Fundamentals of Probability (Grade: B+)

Instructor: David Gamarnik

European Summer School in Logic, Language and Information, Opole, Poland.

(Aug, 2012)

Logic and Computation

Awards

Telecom Italia Big Data Challenge

(Mar, 2014)

Finalist - Data Analytics Track

Team: Social Computing & Artificial Intelligence Lab (SCAI Lab), Masdar Institute.

Idea Title: Misery Loves Company.

Certificate of Excellence (4 times)

(2010, 2011, 2012, and 2013)

For Outstanding Academic Performance and Maintaining a GPA of 4.0

Masdar Institute, Abu Dhabi UAE