Natalie Fridman, Ph.D

Lecturer, CTO & Co-Founder, VP R&D

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Ph.D in computer science, Bar Ilan University. 23 publications and 6 patents in the AI field. 7 years of experience as a lecturer in the Department of Computer Science and over 15 years of experience in the high-tech industry in senior management positions. Senior management experience in the fields of AI, Deep Learning and Software Development. Proven track record in shaping and executing technology vision, driving end-to-end product development, and building the R&D roadmap from the ground up. Extensive experience in building cohesive, high functioning teams from scratch. Algorithm expertise in the fields of Behavior Analysis and Prediction, Deep Learning, Machine Learning, Modeling Autonomous and Collaborative teams of agents.

Professional Experience

2023 – 2025 **CTO & Co-Founder**

Clarity

- Proven experience in leading deep tech product development from idea to prototype to product.
- Drive the technical roadmap with a strong focus on IP development and research breakthroughs.
- Recruit, mentor, and manage a high-caliber technical team (engineers, researchers, data scientists).
- Support fundraising efforts by communicating the technological edge and roadmap. Clarity raised 16M$ in seed.
- Lead architecture, design, and development of the core product and platform
- Inventor of patent issued by the company.

2015 – 2023 **VP R&D**

ImageSat International N.V. (ISI)

- Managing team of over 30 algorithm developers, AI researchers and software engineers responsible for the development of AI products, including intelligence systems and ground station for multi-satellite operation.
- Member of Senior Management team: driving and influencing company mission, strategic direction, and execution. Participated in the company's IPO on the stock exchange.
- Head of Development of the KINGFISHER™ maritime system.
  The KINGFISHER is a maritime multi-layer intelligence system created for an in-depth analysis of large maritime areas of interest in order to provide maritime awareness and detect illegal activities.
- Head of Development of the GEOIMPACT platform.
  GEOIMPACT is a cloud based, AI and data platform responsible for data pipelines and executes a variety of AI/ML algorithms.

- Conducted applied research during all stages, from idea to implementation, in the following fields: behavior analysis and prediction, deep and machine learning, optimization problems, multi agent systems.
- Inventor of patent issued by the company.

2012 – 2015 **Artificial Intelligence (AI) Team Lead**
Elbit Systems
Team leader of algorithm developers in various AI fields: autonomous robots/agents, collaborative teams, multi agent systems, decision making, teamwork, optimization problems, machine learning.

2007-2009 **Software Developer**
BVR Systems (Now, Elbit Systems)
Member of R&D team, responsible for developing teamwork architecture for autonomous and collaborative team of entities.
Inventor of patent issued by the company.

Academic Experience:

Ph.D research field in modeling collective behaviors, teamwork, decision making, cognitive architectures and qualitative reasoning.

I developed algorithms of autonomous social entities, which actively collaborate in dynamic environments. I designed high fidelity crowd models of demonstrations (funded by MAFAT), evacuation and pedestrian behavior (funded by the US Air Force).

2012-2016 Lecturer in Computer Science Department,
The College of Management Academic Studies
2009-2012 Lecturer in Computer Science Department, Bar Ilan University
2008-2009 Teaching assistant in Computer Science Department, Bar Ilan University

Academic Education

2007 – 2012 **Ph.D, Bar Ilan University Computer Science Department**
Topic: "Modeling Crowd Behaviors"
Advisor: Prof. Gal Kaminka
Bar-Ilan University Presidents scholarship for excellent Ph.D student
2004 - 2006 **M.Sc. Computer Science Dept., Bar Ilan University**
Topic: "Modeling Crowd Behavior Based on Social Comparison Theory"
Advisor: Prof. Gal Kaminka
2001 - 2004 **B.Sc. (summa cum laude) Mathematics and Computer Science**
Computer Science Dept. Ariel / Bar Ilan University

Scholarships, Prizes and Awards:

Bar-Ilan University Presidents scholarship for excellent Ph.D student, 2007-2011

Publications:

Patents:

1. Enhancing deepfake detection using forensic models. Michael Matias, Gil Avriel, Natalie Fridman, Shmuel Ur. 2025
2. Creating machine learning models for detecting the application of specific deepfake tools. Michael Matias, Gil Avriel, Natalie Fridman, Shmuel Ur. 2024
3. Detecting deepfake content. Michael Matias, Gil Avriel, Natalie Fridman, Shmuel Ur. 2024
4. Content specific real-time enhancement of deepfake detection, using data set creation and training. Michael Matias, Gil Avriel, Natalie Fridman, Shmuel Ur. 2024
5. Multi satellite detection and tracking of moving objects. Natalie Fridman, Doron Amir, Ilan Schvartzman and Noam Segal. 2017

6. Computing Solutions to Problems Using Dynamic Association between Abstract Graphs. Meirav Hadad, Dekel Tzidon, Natalie Fridman. 2008

Refereed Journal Articles:

1. Gal A. Kaminka and Natalie Fridman. *Simulating urban pedestrians crowds of different cultures*. ACM Transactions on Intelligent Systems and Technology, 2017.

2. Natalie Fridman and Gal A. Kaminka. *Using Qualitative Reasoning for Social Simulation of Crowds*. ACM Transactions on Intelligent Systems and Technology, 2012.

3. Natalie Fridman and Gal A. Kaminka. *Towards a Computational Model of Social Comparison: Some Implications for the Cognitive Architecture*. In Cognitive Systems Research, 12(2):186-197, 2011.

4. Natalie Fridman and Gal A. Kaminka. *Modeling pedestrian crowd behavior based on a cognitive model of social comparison theory.* Computational and Mathematical Organizational Theory. Special issue on Social Simulation from the Perspective of Artificial Intelligence, 2010

Papers published in proceedings of academic conferences:

1. Natalie Fridman, Doron Amir, Yinon Douchan and Noa Agmon. *Satellite detection of moving objects in marine environments*. Thirty-First Annual Conference on Innovative Applications of Artificial Intelligence (IAAI-19), 2019.

2. Natalie Fridman, Doron Amir, Ilan Schvartzman, Igor Kleinerman, Oded Stawitzky, Sharon Kligsberg and Noa Agmon. *Finding a needle in a haystack: Satellite detection of moving objects in marine environments: An Extended Abstract*. International Joint Conference on Autonomous Agents and Multi-Agent Systems, AAMAS, 2017.

3. Natalie Fridman, Doron Amir, Ilan Schvartzman, Igor Kleinerman, Yulia Sulkovski, Zenia Gorlik, Sharon Kligsberg. *KINGFISHER: Total Maritime Awareness System*. International Joint Conference on Autonomous Agents and Multi-Agent Systems, AAMAS, 2017.

4. Natalie Fridman, Gal Kaminka and Avishay Zilka. *The impact of culture on crowd dynamics: an empirical approach*. International Joint Conference on Autonomous Agents and Multi-Agent Systems, AAMAS, 2013

5. Natalie Fridman, Avishy Zilka, and Gal A. Kaminka. *The impact of cultural differences on crowd dynamics in pedestrian and evacuation domains: An Extended Abstract*. In Proceedings of the Eleventh International Joint Conference on Autonomous Agents and Multi-Agent Systems (AAMAS-12), 2012. Poster

6. Natalie Fridman, Tomer Zilberstein and Gal Kaminka. *Predicting Demonstrations' Violence Level Using Qualitative Reasoning*. In International Conference on Social Computing, Behavioral-Cultural Modeling, & Prediction (SBP), 2011.

7. Jason Tsai, Natalie Fridman, Emma Bowring, Matthew Brown, Shira Epstein, Gal Kaminka, Stacy Marsella, Andrew Ogden, Inbal Rika, Ankur Sheel, Matthew Taylor, Xuezhi Wang, Avishay Zilka, Milind Tambe. *ESCAPES: Evacuation Simulation with Children, Authorities, Parents, Emotions, and Social Comparison.* In Proceedings of the Tenth International Joint Conference on Autonomous Agents and Multi-Agent Systems (AAMAS-11), 2011.

8. Natalie Fridman, Gal A. Kaminka and Avishay Zilka. *Towards Qualitative Reasoning for Policy Decision Support in Demonstrations.* In Agent-based Modeling for PoLicy Engineering (AMPLE) workshop at AAMAS 2011.

9. Gal Kaminka and Natalie Fridman. *Using Qualitative Reasoning for Social Simulation of Crowds: A Preliminary Report*. In Qualitative Reasoning (QR) workshop, 2011.

10. Jason Tsai, Emma Bowring, Shira Epstein, Natalie Fridman, Prakhar Garg, Gal Kaminka, Andrew Ogden, Milind Tambe, and Matthew Taylor. *Agent-based Evacuation Modeling: Simulating the Los Angeles International Airport.* In Workshop on Emergency Management: Incident, Resource, and Supply Chain Management (EMWS-09), 2009.

11. Natalie Fridman and Gal A. Kaminka. *Comparing Human and Synthetic Group Behaviors: A Model Based on Social Psychology*. In International Conference on Cognitive Modeling (ICCM-09), 2009. A previous version of this paper appeared in the proceedings of the Multi-Agent Based Simulation (MABS) workshop at AAMAS-2009.

12. Natalie Fridman, Gal A. Kaminka and Meytal Traub. *First Steps Towards a Social Comparison Model of Crowds. In International Conference on Cognitive Modeling* (ICCM-09), 2009. A slightly different version of this paper also appears in the Social Simulation workshop at IJCAI 2009.

13. Meirav Hadad, Natalie Fridman and Gilad Armon-Kest. *AMIaGO: Autonomous Multiple Intelligent-agents with Goal Orientation*. System demonstration in European Conference on Artificial Intelligence (ECAI-08) 2008.

14. Natalie Fridman and Gal A. Kaminka. *Towards a Cognitive Model of Crowd Behavior Based on Social Comparison Theory*. In Proceedings of the Twenty-Second National Conference on Artificial Intelligence (AAAI-07), 2007.

15. Gal A. Kaminka and Natalie Fridman. *Social Comparison in Crowds: A Short Report.* In Proceedings of the Sixth International Joint Conference on Autonomous Agents and Multi-Agent Systems (AAMAS-07), 2007.

16. Gal A. Kaminka and Natalie Fridman. *A Cognitive Model of Crowd Behavior Based on Social Comparison Theory*. In Proceedings of the AAAI-2006 workshop on cognitive modeling, 2006.

Chapters in Books and Technical Reports:

1. Natalie Fridman, Avishy Zilka, and Gal A. Kaminka. *The impact of cultural differences on crowd dynamics in pedestrian and evacuation domains.* Technical Report MAVERICK 2011/01, Bar Ilan University, Computer Science Department, MAVERICK Group, available at http://www.cs.biu.ac.il/galk/Publications/, 2011.

2. Natalie Fridman and Gal A. Kaminka. *Modeling Imitational Behavior via Social Comparison Theory (Extended Abstract).* In C. Pelachaud, J. Martin, E. Andre, G. Chollet, K. Karpouzis, and D. Pele, editors, Intelligent Virtual Agents 2007 , {LNAI}, pp. 377-378, Springer-Verlag, 2007.

3. Natalie Fridman and Gal A. Kaminka. *Modeling Crowd Behavior Based on Social Comparison Theory: Extended Abstract.* In El Yacoubi, S., B. Chopard, and S. Bandini, editors, ACRI 2006, {LNCS}, pp. 694-698, Springer-Verlag, 2006.