

Lior Noy, PhD

Creative Action Lab

RESEARCH BRIEF

Exploration and discovery processes are central to human development at different levels: individuals (e.g. in learning), dyads (mother-infant relationship), groups (ideation processes) and larger systems (discoveries in science, art and technology). I study the basic principles underlying the dynamics of exploration and discovery. I do so by distilling complex human interactions into simple experimental settings that allow computational analysis of behavior and modeling its dynamics.

For example, during a postdoc in Harvard Medical School, I developed a novel paradigm for quantitatively studying joint improvisation, the mirror game, in which two people co-create synchronized and dance-like motion. Using this paradigm, we found a basic mechanism of joint improvisation: a dynamic of switches between two states: a reactive leader-follower relationship and a co-predictive state of agreement. The mirror game paradigm is making inroads in social neuroscience and developmental psychology and is being developed as an assessment and treatment tool for people with schizophrenia and autistic spectrum disorder.

My current research interests include: developing computational paradigms for studying creative exploration in small groups; connecting these paradigms to different fields in the behavioral and cognitive sciences; creative human-agent interactions. My long-term goal is to develop a computational science of creative collaboration.

PUBLICATION METRICS¹

25 cited publications (20/25 journal publications), 1208 citations

H-Index = 16, average 3-year citations rate = 164.3 (2022-2024, GS)

(see full list of publications below)

EDUCATION

1997 B.Sc. in Computer Science & B.A. in Psychology (Tel-Aviv University)

2004 M.Sc. in Computer Science (Weizmann Institute)

2009 Ph.D. in Computer Science (Weizmann Institute)

Supervisor: Prof. Tamar Flash. Thesis: *From Action to Perception and Back Again*

I studied the transformation of perceived movement to action by studying human behavior (using motion tracking and eye movements) and developing computational models for robotic imitation.

¹ Google Scholar, April 18, 2025

POSITIONS

2009-2010	Harvard Medical School, Postdoctoral Fellow
2010-2012	Weizmann Institute, Postdoctoral Fellow
2013-2016	Weizmann Institute of Science, Senior Intern
2017	Tel Aviv University, School of Business Administration, Lecturer (external)
2018-2020	IDC Herzliya, School of Business Administration, Teaching and Research Fellow
2021-2022	Ono Academic College, Faculty of Business Administration, Lecturer
2023-	Ono Academic College, Faculty of Business Administration, Senior Lecturer
2023-	Ono Academic College, Head of Computer Science Program
2024 -	Ono Academic College, Coordinator: AI Courses in Business School (all tracks)

ON-GOING RESEARCH PROJECTS & NOTABLE COLLABORATIONS

(1) *Collective story-telling: from human-human to human-agent interaction*

With: Prof Arik Shamir (Reichmann University, RU), MSc thesis: Idan Vidra & Gal Kimron (RU)

We develop an online chat-box to collect short stories created together by two agents. The project has three stages: (1) setup development (2) collecting hundreds of stories from human-human interactions (3) developing a computational agent that can pass the Turing test in collaborative story creation

(2) *Studying the role of secure attachment in joint improvisation*

with: Prof Mario Mikulincer (RU), Jason Friedman (TAU), MA thesis: Daniel Khanoukov

We use a virtual version of the mirror-game paradigm to test the effect of secure attachment (a fundamental construct from developmental and social psychology) on collaboration and creativity

(3) *Security and Creativity*

with: Prof Mario Mikulincer (RU), PhD thesis: Maor Rosenberg (TAU IEM)

Test the effects of security priming and attachment style of creative exploration using and on-line version of the *creative foraging game (CFG)*

(4) *Collective creative exploration*

With: Prof Krisitian Tylén (Interacting Mind Center, Aarhus University, Denmark), PhD thesis: Maor Rosenberg (TAU IEM)

Extending our computational work on creative exploration (using the *creative foraging game*) to dyadic interactions, in order to understand collective creativity and develop human-agent creative collaborations

(5) *Understanding Slow Motion*

With: Prof Jason Friedman (TAU), Prof Robrecht van der Wel (Rutgers)

Following our finding on the lack of slow motion in joint movement improvisation (Noy & Friedman 2017), we started several research lines trying to understand the cognitive and bio-mechanical factors for the lack of (naturally occurring) slow motion in humans, including in special populations (eg, people with Parkinson).

As part of this research program we organized the first meeting on [Slow Motion](#)

(6) *Online Creativity Games using Citizen Science*

With: Prof Jacob Sherson and multiple partners ([Center for Hybrid Intelligence](#), Aarhus University, Denmark)

Developing a suite of online creative game, and collect data from 10K to 100K of participants, building on the current infrastructure of the [Science-At-Home](#), with the long-term goal of developing a computational model of human creativity

REVIEWER

ISF; Frontiers in Psychology; Journal of Cognitive Science; Journal of Motor Control

SCIENTIFIC LEADERSHIP

I co-founded and led (with Uri Alon) the “Theatre Lab @Weizmann Institute” an interdisciplinary research project (2013-2016), combining concepts and tools from the performing arts, behavioral sciences, computer science and physics, to study performance related phenomena such as joint improvisation, creativity and dramatic action.

Initiated and organized a conference “*Joint Improvisation Meeting (JIM)*”, the first scientific conference on joint improvisation, November 2015, Paris (with Asaf Bachrach, CNRS) (full video of the conference: labodanse.org/jim-2015/)

Initiated and organized a symposium “*Reciprocity and Shared Leadership in Joint Action*” in International Conference of Psychological Science (ICPS, Vienna 2017) (with Natalie Sebanz, CEU)

Organizing committee for JIM2: “*Joint Improvisation Meeting - On Togetherness*”, November 2018, Paris (with Asaf Bachrach, CNRS; Natalie Sebanz CEU)

Since October 2022 I am the vice-chair of the school of Science and Technology in Ono Academic College

Since October 2023 I am also heading the Computer Science Program, and leading a faculty wide effort to include AI related course in all business school programs

SCIENTIFIC LEADERSHIP TRAINING

I am a lead trainer at [HFP](#) consulting (Heidelberg, Germany) – a professional development company focusing on the scientific community. I facilitate Leadership and Management training in academic settings (for PI’s, post-docs, core facility managers, and recently - department head) on a variety of topics, including communication, negotiation, time-management and different tools for effectively leading individuals and teams (eg, dealing with undermotivated students, and how to ‘Say No!’).

HFP gives 70-80 workshops annually around the world in leading research institutes including Harvard, MIT, Cambridge and System X. We also worked in Africa (with the Bill and Melinda Gates foundation) and in Japan. In Israel we have a decade of intense collaboration with the Weizmann Institute, the Technion and Ben Gurion university and more sporadic partnership with Bar-Ilan and Tel-Aviv universities, the Volcani institute and Azrieli foundation.

Within HFP I develop specialized training for listening and creativity and facilitate the establishment of peer-groups in academic settings.

Recently, I am developing a new peer-to-peer support network for Phd students.

IMPROVISATION

For almost 20 years I have been engaged in theater improvisation as a performer and teacher. MY main work is within Playback Theater, an improvisation form based on real-life stories, employed for bringing communities together in a variety of settings.

JOURNAL PUBLICATIONS

(1) [L. Noy](#), R. I. Rumiati, and T. Flash, “Simple movement imitation: are kinematic features sufficient to map perceptions into actions?”, **Brain and Cognition**, 69(2), 360–8, **2009** [15 citations]

(2) [L. Noy](#), E. Dekel, and U. Alon, “The mirror game as a paradigm for studying the dynamics of two people improvising motion together”, **Proceedings of National Academy of Science**, 108 (52), 20947–52, **2011** [389 citations]

(3) *Y. Hart, *[L. Noy](#), R. Feniger-Schaal, A. E. Mayo, and U. Alon, “Individuality and togetherness in joint improvised motion”, **PLOS One**, 9 (2), e87213, **2014** [109 citations]

- (4) L. Noy, U. Alon, and J. Friedman, "Corrective jitter motion shows similar individual frequencies for the arm and the finger", **Experimental Brain Research**, 233 (4), 1307–1320, **2015** [23 citations]
- (5) L. Noy, N. Levit-Binun, and Y. Golland, "Being in the zone: physiological markers of togetherness in joint improvisation", **Frontiers in Human Neuroscience**, 9:187, **2015** [171 citations]
- (6) *R. Feniger-Schaal, *L. Noy, Y. Hart, N. Koren-Karie, A. E. Mayo, and U. Alon, "Would you like to play together? Adults' attachment and the mirror game", **Attachment and Human Development**, 18, 33-45, **2016** [50 citations]
- (7) A. Dahan, L. Noy, A. E. Mayo, and U. Alon, "Exit from synchrony in joint improvised motion", **PLOS One**, 11(10), e0160747, **2016** [45 citations]
- (8) G. Gaziv, L. Noy, Y. Liron, U. Alon, "A reduced-dimensionality approach to uncovering dyadic modes of body motion in conversations", **PLOS One**, 12(1), e0170786, **2017** [21 citations]
- (9) L. Noy, N. Weiser, J. Friedman, "Synchrony in improvised joint action is directed by each participant's motor control system", **Frontiers in Psychology**, 8:531, **2017** [18 citations]
- (10) Y. Hart, L. Rozenkrantz, A. E. Mayo, R. Mayo, A. Tendler, *U. Alon, and *L. Noy, "Creative foraging: An experimental paradigm for studying the dynamics of exploration and discovery", **PLOS One**, 12(8), e0182133, **2017** [54 citations]
- (11) L. Rozenkrantz, A. E. Mayo, Y. Hart, *L. Noy, and *U. Alon, "Placebo can enhance creativity", **PLOS One** 12(9), e0182466, **2017** [44 citations]
- (12) R. S. Brezis, L. Noy, T. Alony, R. Gotlieb, R. Cohen, Y. Golland & N. Levit-Binnun, "Patterns of Joint Improvisation in Adults with Autism Spectrum Disorder", **Frontiers in Psychology**, 8:1790, **2017** [52 citations]
- (13) R. Feniger-Schaal, Y. Hart, N. Lotan, N. Koren-Karie, L. Noy, "The body speaks: Using the mirror game to link attachment and non-verbal behavior", **Frontiers in Psychology, Clinical and Health Psychology**, 9:1560, **2018** [63 citations]
- (14) Y. Hart, H. Goldberg, E. Striem-Amit, A. E. Mayo, L. Noy, A. Uri, "Creative exploration as a scale-invariant search on a meaning landscape", **Nature Communication** 9(1), 5411, **2018** [38 citations]
- (15) J. Rafner, M. Biskjaer, B. Zana, S. Langsford, C. Bergenholtz, S. Rahimi, A. Carugati, L. Noy, J. Sherson, Digital Games for Creativity Assessment: Strengths, Weaknesses and Opportunities, **Creativity Research Journal**, 34 (1), 28-54, **2022** [34 citations]
- (16) J. Kalaydjian, J. Laroche, L. Noy, & A. Bachrach. A distributed model of collective creativity in free play. *Frontiers in Education*, 7, 902251, **2022** [4 citations]
- (17) J. Rafner, Q. J. Wang, M. Gadjacz, T. Badts, B. Baker, C. Bergenholtz, M. M. Biskjaer, T. Bui, A. Carugati, M. De Cibeins, L. Noy, S. Rahimi, K. Tylén, B. Zana, R. E. Beaty, & J. Sherson, Towards Game-Based Assessment of Creative Thinking. *Creativity Research Journal*, 35(4), 763–782, **2023** [6 citation]

- (18) J. Laroche, A. Bachrach, & L. Noy, "De-sync: Disruption of synchronization as a key factor in individual and collective creative processes", *BMC Neuroscience*, 25(1), 67, 2024 [3 citations]
- (19) L. Noy, R. Van Der Wel, & J. Friedman, "A slow limit: Extensive motor training cannot overcome a limit on the production of slow and smooth motion", *Journal of Neurophysiology*, 2024 [1 citation]
- (20) L. Noy, S. Hassin-Baer, T. Fay-Karmon, N. Kattouf, S. Israeli-Korn, R. Van Der Wel, & J. Friedman, "Submovements in manual tracking: People with Parkinson's disease produce more submovements than age-matched controls", *Journal of NeuroEngineering and Rehabilitation*, 22(1), 51, 2025

BOOK CHAPTERS

- (1) L. Noy, "The mirror game: a natural science study of togetherness," in: **Performance Studies in Motion: International Perspectives and Practices in the Twenty-First Century.**, D. Citron, A., Aronson-Lehavi, S., & Zerbib, Ed., Bloomsbury Methuen Drama, London, pp. 318–327. **2014** [4 citations]

CITED PROCEEDING

- (1) L. Noy*, Y. Hart*, N. Andrew*, O. Ramote, A. Mayo, and U. Alon, "A quantitative study of creative leaps," in Proceedings: **International Conference of Computational Creativity**, pp. 72-76, **2012** [30 citations]
- (2) J. Rafner, A. Hjorth, S. Risi, L. Philipsen, C. Dumas, M. Biskjær, L. Noy, K. Tylen, J. Lynch, C. Bergenholtz, B. Zana, J. Sherson, "crea. blender: A Neural Network-Based Image Generation Game to Assess Creativity." In Extended Abstracts of the **Annual Symposium on Computer-Human Interaction in Play**, pp. 340-344, **2020** [18 citations]
- (3) Gajdacz M, Rafner J, Langsford S, Hjorth A, Bergenholtz C, Biskjaer MM, Noy L, Risi S, Sherson J. CREA. blender: a GAN based casual creator for creativity assessment. In Proceedings of the **International Conference on Computational Creativity (ICCC'21)**, pp 5, **2021** [6 citations]
- (4) M. Rosenberg, G. Gordon, L. Noy, K. Tylen. (2023). Social interaction dynamics modulates collective creativity, **Proceedings of the Annual Meeting of the Cognitive Science Society**, 44(44), **2022** [9 citations]

GRANTS

DFG conference grant (2023, 6k Euro), "*Collective creativity: Unlocking the role of dyadic expertise in coordinated joint motion*", with Prof Merle Fairhurst (TU Dresden) and Dr Katrin Heimann (Aarhus University) [a small grant toward writing a bigger DFG framework]

PLAYTrack/Interacting Minds Centre, Aarhus University, LEGO seed fund (2019, 4k euro) "*Investigating collective, creative exploration*", with Kristian Tylen (Aarhus University, Denmark)

CNRS, UMR 7023 Prime grant (2019, 6k euro) *“The inter-corporeal genesis of collective creativity”*, with Asaf Bachrach (CNRS, Paris)

Ile de France region DIM, Brain and Mind Initiative, conference grant (2015, 8k euro) *“The Science of Joint Improvisation”*, with Asaf Bachrach (CNRS, Paris)

I also was involved in writing two grants as a postdoc:

Weizmann Institute internal grants for the “Theatre Lab” (2012-2013, 40k usd, from the Braginsky Center for the Interface between Science and the Humanities)

ISF grant (2012-2015, 200k NIS) *“Studying the physiological processes underlying interpersonal synchrony”*, in collaboration with Yulia Golland (IDC)

ACADEMIC TEACHING

Course	Institute	Short Description	Program	Years	Number of cycles
<i>The Scientific Research of Creativity</i>	Weizmann	Research seminar	Graduate research seminar	2012	1
<i>Managing for Creativity</i>	TAU, Ono	Theories and practices for managing creativity	MBA	2017	3
<i>From human-human to human-agent interaction</i>	IDC	Research seminar	BA in communication	2018	1
<i>The Psychology of Ideation and Creativity</i>	IDC	Theories and practices of ideation and creativity	BA in entrepreneurship (IDC), BSc in CS (Ono)	2018-2021	9
<i>Innovation and Technological Revolutions</i>	IDC, Ono	An introduction to innovation and current disruptive technologies	BA in entrepreneurship (IDC), BSc in CS (Ono)	2020-2021	2
<i>Introduction to Digital Innovation</i>	IDC	An introduction to the digital revolution, with an emphasis on AI and machine learning (mandatory)	BA in business administration	2018-2021	15
<i>Entrepreneurship and Innovation</i>	Ono	Theories and practices of entrepreneurship in organizations	MBA	2021-2025	10
<i>AI in the business world</i>	Ruppiner	An introduction to AI and machine learning for MBA students	MBA	2020-2021	2
<i>Introduction to Computer Science</i>	Ono	Introduction course in CS: learning Python and basic concepts (algorithms, computational thinking, basic data-structure)	BSc in CS (Ono)	2022-2025	4
<i>Final Project in CS</i>	Ono	Mentoring teams in 3 rd year final project	BSc in CS (Ono)	2022-2025	4
<i>AI in the business world</i>	Ono	An introduction to AI in the business world of BA students (different programs: HR, IS)	BA (Ono)	2023-2025	4