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R E S U M E

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ACADEMIC DEGREES

- Ph.D. (direct track), Aerospace Engineering, Technion - IIT, 2011
- M.A., Aerospace Engineering, Technion - IIT, 2008
- B.A. (Cum Laude), Computer Science, Technion – IIT, 2002
- B.Sc. (Summa Cum Laude), Aerospace Engineering, Technion - IIT, 2002

ACADEMIC APPOINTMENTS

2020-present	Associate Professor, Department of Aerospace Engineering, Technion – IIT
2014-2020	Assistant Professor, Department of Aerospace Engineering, Technion – IIT
2012-2014	Post Doctorate Fellow, Institute of Robotics and Intelligent Machines Georgia Institute of Technology, Atlanta, USA

PROFESSIONAL EXPERIENCE

2017-present	Independent consultant
2011-2012	Researcher and algorithm developer, Computer vision department, RAFAEL, Advanced Defense Systems, Israel
2004-2007	Algorithm developer, Navigation and Control departments, RAFAEL, Advanced Defense Systems, Israel
2002-2008	Technical project officer, Engineering-level projects supervision in defense industries on behalf of the Israel Air Force (IAF).

RESEARCH INTERESTS

Autonomous navigation and mapping, consistent distributed information fusion, belief-space planning and active sensing, decision making under uncertainty, distributed robust perception, inference with probabilistic graphical models, data-driven and end-to-end autonomous perception, vision-aided navigation (VAN) and simultaneous localization and mapping (SLAM).

TEACHING EXPERIENCE

- Introduced and developed the course "Autonomous Navigation and Perception" (joint level), Department of Aerospace Engineering, Technion.
- Introduced and developed the course "Vision Aided Navigation" (joint level), Department of Aerospace Engineering, Technion.
- Lecturer in additional courses in Department of Aerospace Engineering, Technion: "Navigation and Guidance Systems", "Flight Mechanics", "Advanced Control Laboratory"
- Guest lecturing in "Introduction to Robotics" (joint level), Computer Science Department, Technion.
- Guest lecturing in "Algorithmic Robotics and Motion Planning" (graduate level course), Computer Science Department, Tel Aviv University.
- Guest lecturing in "3D Reconstruction" (graduate level course), College of Computing, Georgia Institute of Technology.
- Teaching assistant, "Dynamic Systems" (undergraduate level course), Department of Aerospace Engineering, Technion.

TECHNION ACTIVITIES

- 2018-present, a council member of the Technion's Autonomous Systems Program (TASP)
- 2019-present: introduced and co-organized Technion's Robotics and Autonomous Systems seminars
- 2020-present: a council member of the Technion Human Health Initiative

DEPARTMENTAL ACTIVITES

- 2018-2019: leading the organization of Aerospace Department's strategic discussion and event on academic development directions for the following years.
- 2017-2018, Faculty Council Secretary, Department of Aerospace Engineering, Technion.
- 2015-2017, Aerospace Department representative in Department of Scientific and Technological Education, Technion.

NATIONAL ACTIVITIES

- 2018-present: Member of the national robotics initiative

PUBLIC PROFESSIONAL ACTIVITIES & SERVICE

- 09/2019-present, Co-chair of the IEEE Robotics and Automation Society Technical Committee on Algorithms for Planning and Control of Robot Motion

Editorial Board:

- 2021-present, Senior Editor, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- 2017-present, Associate Editor, IEEE Robotics and Automation Letters (RA-L)

Proposal Reviewer:

- Israel's Ministry of Science and Technology, robotics proposals: 2020

Conference and Workshop Activities:

- Session co-chair at the IEEE International Conference on Robotics and Automation (ICRA), 2021: *Localization and Mapping XIII; Path Planning I*
- Area Chair at International Symposium on Multi-Robot and Multi-Agent Systems (MRS), 2021
- Session chair at the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020: *Semantic Scene Understanding I; Visual SLAM III*
- Session chair at the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2019: *Vision-based Navigation*
- Session chair at the Israeli Conference on Robotics (ICR), 2019: *Localization and Navigation*
- Session chair at the 59th Israel Annual Conference on Aerospace Sciences (59th IACAS), 2019: *Autonomous Systems*
- Session chair at the 58th Israel Annual Conference on Aerospace Sciences (58th IACAS), 2018: *Autonomous Systems*
- Workshop co-organizer: Israeli Association for Automatic Control (IAAC) workshop "Navigation Systems and Applications", 2020, 2018
- Session chair at the IEEE International Conference on Robotics and Automation (ICRA), 2017: *SLAM*
- Session chair at the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2016: *Mobile Robots; Sensor Based Planning*
- Session co-chair at the IEEE International Conference on Robotics and Automation (ICRA), 2016: *AI Reasoning Methods*
- Session chair at the Israeli Conference on Robotics (ICR), 2016: *SLAM and Autonomous Navigation*
- Session chair at the IEEE International Conference on Robotics and Automation (ICRA), 2014: *Path planning: Multiple Mobile Robots and Agents*
- Session co-chair at the IEEE International Conference on Robotics and Automation (ICRA), 2014: *SLAM: Visual Odometry*
- Workshop Co-organizer: Workshop on Multi-View Geometry in Robotics, Robotics: Science and Systems (RSS), 2013 – 2015
- Program committee (PC) member: ICRA'18 Workshop on Perception, Inference, and Learning for Joint Semantic, Geometric, and Physical Understanding, 2018
- Program committee (PC) member, Robotics: Science and Systems (RSS), 2012, 2013, 2015
- Program committee (PC) member, IEEE Symposium on Safety, Security and Rescue Robotics, 2013

Journal Reviewer:

- International Journal of Robotics Research (IJRR): 2021, 2020, 2016-2018, 2014, 2012
- IEEE Transactions on Robotics (T-RO): 2019, 2013-2015
- Transactions on Pattern Analysis and Machine Intelligence (TPAMI): 2018

- IEEE Robotics and Automation Letters (RA-L): 2015
- Journal of Guidance, Control and Dynamics (JGCD): 2015
- Advances in Space Research: 2014
- Robotics Journal: 2015
- Autonomous Robots: 2014
- IET Control Theory & Applications (CTA): 2014
- IEEE Transactions on Vehicular Technology (TVT): 2013
- IEEE Sensors Journal: 2012
- Computer Vision and Image Understanding (CVIU): 2011
- Journal of Field Robotics (JFR): 2011

Conference Reviewer:

- Conference on Robot Learning (CoRL): 2020
- Robotics Science and Systems Conference (RSS): 2019, 2016, 2015, 2013, 2012
- International Symposium on Robotics Research (ISRR): 2019, 2017, 2015
- IEEE International Conference on Robotics and Automation (ICRA): 2014-2019
- IEEE Conference on Intelligent Robotic Systems (IROS): 2012-2019
- International Symposium on Multi-Robot and Multi-Agent Systems (MRS): 2019, 2017
- Computer Vision and Pattern Recognition (CVPR): 2014, 2013
- IEEE Symposium on Safety, Security and Rescue Robotics (SSRR): 2013
- Third Joint 3DIM/3DPVT Conference Conference: 2013
- IEEE Workshop on Robot Vision (WORV): 2013
- International Conference on 3D Imaging, Modeling, Processing, Visualization, and Transmission (3DIMPVT): 2012
- BarSym Symposium on Estimation, Navigation, and Spacecraft Control: 2012

MEMBERSHIP IN PROFESSIONAL SOCIETIES

- IEEE membership
- Member of the European Laboratory for Learning and Intelligent Systems (ELLIS)
- Member of the Technical Committee on Multi-Robot Systems (TC MRS) of the IEEE Robotics and Automation Society

FELLOWSHIPS, AWARDS AND HONORS

- 2021: **Hanin Award** for excellence in research for young faculty members
- 2015: **Best Workshop Poster Award,** workshop on the Problem of Mobile Sensors, in conjunction with Robotics Science and Systems (RSS) conference, 2015
- 2013: **Merhav Award** for top PhD research in GNC-related areas
- 2013: **Best Poster Award,** Workshop on Robot Vision (WoRV 2013)
- 2010: **Hanin Award** for excellence in research
- 2009: **Ilan Ramon Excellence Scholarship Award**
- 2008: **Best Teaching Assistant Award**, Aerospace Engineering, Technion
- 2002,2006: **Quarterly Excellence Awards,** RAFAEL ltd.
- 2002: B.Sc. **Summa Cum Laude**, Aerospace Engineering, Technion

- 2002: B.A. **Cum Laude**, Computer Science, Technion
- 1998-2002: **President's Excellence Honor Awards**, Technion

GRADUATE STUDENTS

(PA=Primary Adviser, AA=Additional Adviser)

Completed

Ph.D. Students (2):

2017-2021 Dmitry Kopitkov, TASP, Technion, PA
Thesis title: "General Probabilistic Surface Optimization"

2015-2021 Elad Farhi, direct track Ph.D., TASP, Technion, PA
Thesis title: "Joint Incremental Inference and Belief Space Planning for Online Operations of Autonomous Systems"
Next position: Senior visual SLAM algorithm developer engineer at General Motors.

M.Sc. Students (8):

2014-2016 Tal Regev, Department of Computer Science, Technion, PA
Thesis title: "Multi-Robot Decentralized Belief Space Planning in Unknown Environments"
Next position: Lab manager and software engineer at ANPL

2015-2017 Shira Har-Nes, Department of Aerospace Engineering, Technion, PA
Thesis title: "Belief Space Planning for Autonomous Navigation while Modeling Landmark Identification"
Next position: Engineer at Rafael ltd.

2015-2017 Antony Thomas, Department of Aerospace Engineering, Technion, PA
Recipient of the **Sherman Interdisciplinary fellowship for graduate students**, 2016
Thesis title: "Incorporating Data Association Within Belief Space Planning For Robust Autonomous Navigation"
Next position: Ph.D. student at the University of Genoa, Italy

2015-2017 Michael Chojnacki, TASP, Technion, PA (AA: Ehud Rivlin)
Thesis title: "Vision-based Dynamic Target Trajectory and Ego-motion Estimation Using Incremental Light Bundle Adjustment"
Next position: Startup co-founder (Baseline Vision ltd.)

2015-2017 Dmitry Kopitkov, TASP, Technion, PA
Summa Cum Laude M.Sc. degree
Recipient of the **Gutwirth and Jacobs excellence fellowship**, 2016 and 2017
Thesis title: "Efficient Belief Space Planning in High-dimensional State Spaces by Exploiting Sparsity and Calculation Re-use"
Next position: Ph.D. student at ANPL

2014-2017 Yair Ben Elisha, Department of Aerospace Engineering, Technion, PA
Thesis title: "Cooperative Multi-Robot Belief Space Planning for Visual-Inertial Navigation and Online Sensor Calibration"
Next position: Major at IAF

2016-2018 Vladimir Ovechkin, TASP, Technion, PA
Thesis title: "Bundle Adjustment with Feature Scale Constraints for Enhanced Estimation Accuracy"
Next position: Computer vision engineer at Applied Materials ltd.

2018-2020 Omri Asraf, Department of Aerospace Engineering, Technion, PA
Thesis title: "Experience-Based Prediction of Unknown Environments for Enhanced Belief Space Planning"
Next position: Algorithms Researcher at Huawei ltd.

M.E. Students (2):

2016-2017 Itay Guy, TASP, Technion, PA

2016-2018 Or Salmon, TASP, Technion, PA
Next position: Startup co-founder

In Progress

Ph.D. Students (6):

2017- Vladimr Tchoyev, Department of Aerospace Engineering, Technion, PA
Thesis title: "Multi-Robot Autonomous Classification Under Uncertainty"
Recipient of the **Merhav excellence award for Ph.D. research**, 2021
Expected year of graduation: summer 2021

2015- Khen Elimelech, direct track Ph.D., TASP, Technion, PA
Thesis title: "Efficient Decision Making Under Uncertainty in High-Dimensional State Spaces"
Expected year of graduation: summer 2021

2015- Yuri Feldman, direct track Ph.D., Department of Computer Science, Technion, PA
Thesis title: "Autonomous Semantic Perception in Uncertain Environments"
Expected year of graduation: 2022

2019- Moshe Shienman, direct track Ph.D., TASP, Technion, PA

2020- Andrey Zhitnikov, TASP, Technion, PA

2021- Moran Barenboim, TASP, Technion, PA

M.Sc. Students (5):

2016- Roee Mor, Department of Computer Science, Technion, PA (AA: Michael Lindenbaum)

Thesis title: "Qualitative Relative Constraints Based SLAM and Obstacle Avoidance"
Expected year of graduation: 2021

2018- Ohad Shelly, TASP, Technion, PA
Thesis title: "Computationally Efficient Multimodal Perception and Belief Space Planning"
Expected year of graduation: 2021

2019- Itai Zilberman, Department of Electrical Engineering, Technion, AA (PA: Ehud Rivlin)
Expected year of graduation: 2021

2019- Gilad Rotman, TASP, Technion, PA

2020- Ori Sztyglic, CS, Technion, PA
Recipient of an **excellence scholarship** by the Israeli Smart Transportation Research Center, 2021

UNDERGRADUATE STUDENTS

(CS=Computer Science, EE=Electrical Engineering, AE=Aerospace Engineering, ME=Mechanical Engineering)

Dan Goldberg (CS, 2014-2015), Dror Hurwitz (AE, 2016), Maor Kereth (ME, summer 2016), Dror Bar On (AE, 2016), Nikita Dizhur (CS, 2016-2017), Roy Velich (CS, 2016-2017), Steven Athouel (CS, 2017 Spring), Amit Weiss (CS, 2017 Fall), Amit Solomon (CS, 2017 Fall), Margarita Zabolotny (AE, 2017-2018), Nimrod Sideman (AE, 2017 Fall), Daniel Khapun (CS, 2018), Dvir Perry (CS, 2018 Spring), Tom Norman (EE, 2018-2019), Amitai Haimovich (AE, 2018), Ariel Dobrovenski (EE, 2018-Present), Eva Epelbaum (CS, 2018-2019), Adi Amuzig (AE, 2019 Spring), Shai Guendelman (CS, 2019 Fall), Gregorii Melnikov (CS, 2019-2020), Avia Asaev (CS, 2020 Spring - Present).

VISITING STUDENTS & INTERNATIONAL INTERNS

Sarah Brent (Clark University, summer 2016), Steven Athouel (L'Ecole polytechnique Université Paris, Spring 2018)

SPONSORED LONG-TERM VISITORS AND POST-DOCTORAL ASSOCIATES

- Dr. Andrej Kitanov, since April 2017
- Dr. Shashank Pathak, November 2015 – June 2017
- Dr. Elina Moldavskaya, October 2015 – June 2016

ADDITIONAL STAFF SUPPORTED

- Anton Gulyaev, lab engineer, since February 2021
- Evgeny Koretsky, lab engineer, March 2019 - June 2020
- Asaf Feniger, lab engineer, April 2015 - June 2018
- Tal Regev, software engineer, October 2016 - August 2017, July 2018 – January 2019

RESEARCH GRANTS

Competitive:

10/2015-10/2019 Israel Science Foundation (ISF)
Role: Principal Investigator
Title: "Information-Theoretic Decision Making and Planning under Uncertainty in the Conservative Belief Space: a New Paradigm"
Amount: $280,000 ($70,000 per year, for 4 years)

12/2015-12/2018 Ministry of Science Technology and Space (MOST)
Russian-Israeli Cooperative Scientific Research
Role: Principal Investigator
Title: "Localization, Mapping and Path Planning for an Unmanned Ground Vehicle (UGV) with the Aid of a Group of Unmanned Aerial Vehicles (UAVs) Using Active Collaborative Vision and Multi-Robot Belief Space Planning"
Amount: $120,000 ($40,000 per year, for 3 years)

01/2019-01/2022 Ministry of Science Technology and Space (MOST)
Role: Principal Investigator
Title: "Autonomous Semantic Robust Perception in Uncertain Environments"
Amount: $157,000 ($52,000 per year, for 3 years)

01/2019-01/2022 Ministry of Science Technology and Space (MOST)
Role: Principal Investigator
Additional Principal Investigator: Prof. Michael Lindenbaum
Title: "Autonomous Navigation and Mapping via Qualitative Spatial Representation and Probabilistic Planning"
Amount for both PIs: $322,000 ($107,000 per year, for 3 years)

10/2020-10/2024 Israel Science Foundation (ISF)
Role: Principal Investigator
Title: "Efficient Decision Making and Belief Space Planning in High Dimensional State Spaces with Bounded Approximations: a New Paradigm"
Amount: $260,000 ($65,000 per year, for 4 years)

10/2020-10/2023 United States - Israel Binational Science Foundation (BSF), as part of joint program with National Science Foundation (NSF)
Role: Principal Investigator (additional PI: Michael Kaess)
Title: "Resource-Constrained Multi-hypothesis-aware Perception"
Amount: $180,000 ($60,000 per year, for 3 years)

Industrial and other sources:

09/2014-09/2016 Technion Autonomous Systems Program (TASP)
Role: Principal Investigator
Amount: $42,000

08/2015-08/2016 Technion Autonomous Systems Program (TASP)
Role: Principal Investigator
Amount: $27,500

09/2015-09/2016 Israel Ministry of Defence (MAFAT)
Role: Principal Investigator
Amount: $50,000

11/2016-11/2017 Technion Autonomous Systems Program (TASP)
Role: Principal Investigator
Amount: $25,000

11/2017-11/2018 Technion Autonomous Systems Program (TASP)
Role: Principal Investigator
Amount: $15,000

02/2017-02/2018 Israel Ministry of Defence (MAFAT)
Role: Principal Investigator
Amount: $78,000

02/2018-02/2019 Israel Ministry of Defence (MAFAT)
Role: Principal Investigator
Amount: $78,000

03/2018-02/2019 Technion Applied Research Grant
Role: Principal Investigator
Amount: $20,000

07/2018-06/2019 Intel ltd.
Role: Principal Investigator
Amount: $20,000

09/2018-08/2019 Hyundai ltd.
Role: Principal Investigator
Amount: $200,000

01/2020-12/2020 Gordon Center for System Engineering Grant, Technion
Role: Principal Investigator
Amount: $20,000

09/2020-08/2021 Machine Learning & Intelligent Systems (MLIS) Program at Technion
Role: Principal Investigator
Amount: $25,000

11/2020-10/2021 Gordon Center for System Engineering Grant, Technion
Role: Principal Investigator
Amount: $20,000

INVITED TALKS (International)

- "Distributed perception and estimation in multi-robot systems", workshop on Principles of Multi-Robot Systems, in conjunction with Robotics Science and Systems (RSS) conference, Rome, Italy, July 2015.
- "Advances in Computationally Efficient and Robust (Multi-Robot) Belief Space Planning in High-Dimensional State Spaces", 2nd Workshop on Multi-Robot Perception-Driven Control and Planning at the 2018 IEEE/RSJ International Conference on Intelligent Robot and Systems (IROS), October 2018.

INVITED TALKS (In Israel)

- "Distributed Cooperative Robust Localization and Mapping from Arbitrary Initial Poses via EM and Model Selection", Israeli Navigation Workshop, July 2014.
- "Decision Making and Planning in Sparse (Conservative) Belief Space", the Israeli Association for Automatic Control (IAAC) workshop "Motion Control Methods in Robotics", November 2015.
- "Towards Robust Autonomous Navigation in Perceptually Aliased GPS-Deprived Environments", Israeli Navigation Workshop, February 2016.
- "Autonomous Navigation and Perception for Aerial Vehicles", IBM Research Cognitive Computing Colloquium on Computer Vision and Video Technologies, IBM Haifa Research Lab, November 2016.
- "Vision-Aided Navigation and SLAM - Tutorial", IAAC workshop on Vision Aided Navigation, January 2019.
- "Autonomous Online Perception and Navigation in Uncertain Environments", Annual Technion Computer Engineering (TCE) Conference, Autonomous Systems, September 2019.
- "Autonomous Navigation and Perception for Aerial Vehicles", Israel Robotics Meetup, September 2019.

GUEST LECTURES

- "Advances in autonomous operation in uncertain or unknown environments: distributed robust inference and data association, and planning in generalized belief space", Department of Computer Science, Technion, 2014
- "Autonomous operation in uncertain and partially unknown large-scale environments: perception, information fusion and planning", Department of Computer Science, Technion, Ben Gurion and Haifa University; Faculty of Engineering, Bar Ilan University, November 2013.
- "Autonomous navigation in uncertain and partially unknown environments", Faculty of Aerospace Engineering, Technion, November 2013.
- "Efficient incremental structure from motion and vision-based single- and multi-agent localization", Computer Science and Electrical Engineering Departments in: Weizmann Institute of Science, Technion, Tel-Aviv University, Bar Ilan University, Hebrew University of Jerusalem, March 2013.
- "Vision-Aided Single- and Multi-Robot Navigation in Unknown Environments", Faculty of Aerospace Engineering, Technion, March 2013 (Merhav award seminar).
- "Incremental light bundle adjustment for SfM and robotics", Department of Computer Science, University College London, September 2012.
- "Incremental light bundle adjustment for SfM and multi-robot localization", Computer Science and Electrical Engineering departments, Technion, May 2012.

- "Graph-Based Cooperative Navigation Based on Three-View Constraints", Sarnoff/SRI International, Princeton, NJ, January 2012.
- "Graph-Based Cooperative Navigation Based on Three-View Geometry Constraints", Computer Science and Artificial Intelligence Laboratory (CSAIL), MIT, Cambridge, September 2011.

SIGNIFICANT PROFESSIONAL PROJECTS

- 2013-2014, ARL Micro Autonomous Systems and Technology (MAST)
- 2012, DARPA All Source Positioning Navigation (ASPN)
- 2012-2014, participation in GTSAM (open source library) development and implementation
- 2015-2018, OMEK Consortium (3D sensing/perception)
- 2014-present, founder and head of Autonomous Navigation and Perception Laboratory (ANPL)

PUBLICATIONS

Graduate students are underlined; undergraduate students are double-underlined; other group members (postdocs etc.) are marked with *.

Theses

[1] V. Indelman, "Navigation Performance Enhancement Using Online Mosaicking", Ph.D. dissertation, Technion - Israel Institute of Technology, April 2011. Advisors: Pini Gurfil, Ehud Rivlin and Hector Rotstein.

Refereed Papers in Professional Journals

Published Papers:

[1] V. Indelman, P. Gurfil, E. Rivlin and H. Rotstein, "Navigation Aiding Based on Coupled Online Mosaicking and Camera Scanning", Journal of Guidance, Control and Dynamics, 33(6): 1866-1882, 2010.

[2] V. Indelman, P. Gurfil, E. Rivlin and H. Rotstein, "Real-Time Vision-Aided Localization and Navigation Based on Three-View Geometry", IEEE Transactions on Aerospace and Electronic Systems, 48(3): 2239-2259, 2012.

[3] V. Indelman, P. Gurfil, E. Rivlin and H. Rotstein, "Distributed Vision-Aided Cooperative Localization and Navigation Based on Three-View Geometry", Robotics and Autonomous Systems, 60(6): 822-840, 2012.

[4] V. Indelman, P. Gurfil, E. Rivlin and H. Rotstein, "Graph-Based Distributed Cooperative Navigation for a General Multi-Robot Measurement Model", International Journal of Robotics Research (IJRR), 31(9): 1057-1080, 2012.

[5] V. Indelman, S. Williams, M. Kaess and F. Dellaert, “Information Fusion in Navigation Systems via Factor Graph Based Incremental Smoothing”, Robotics and Autonomous Systems, 961(8): 721-738, 2013.

[6] S. Williams, V. Indelman, M. Kaess, R. Roberts, J. J. Leonard and F. Dellaert, “Concurrent Filtering and Smoothing: A Parallel Architecture for Real-Time Navigation and Full Smoothing”, International Journal of Robotics Research (IJRR), 33(12): 1544-1568, 2014.

[7] V. Indelman, L. Carlone and F. Dellaert, “Planning in the Continuous Domain: a Generalized Belief Space Approach for Autonomous Navigation in Unknown Environments”, International Journal of Robotics Research (IJRR), 34(7): 849-882, 2015.

[8] V. Indelman, R. Roberts and F. Dellaert, “Incremental Light Bundle Adjustment for Structure from Motion and Robotics”, Robotics and Autonomous Systems, vol. 70, 63-82, 2015.

[9] V. Indelman, E. Nelson, J. Dong, N. Michael, and F. Dellaert, “Incremental Distributed Inference from Arbitrary Poses and Unknown Data Association”, IEEE Control Systems Magazine, Special Issue on Distributed Control and Estimation for Robotic Vehicle Networks, vol. 36, no. 2, 41-74, 2016.

[10] V. Indelman, “No Correlations Involved: Decision Making Under Uncertainty in the Conservative Information Space”, IEEE Robotics and Automation Letters (RA-L), vol. 1, no. 1, 407-414, 2016.

[11] X. Yan, V. Indelman and B. Boots, “Incremental Sparse GP Regression for Continuous-time Trajectory Estimation & Mapping”, Robotics and Autonomous Systems, 87:120-132, 2017.

[12] V. Indelman, “Cooperative Multi-Robot Belief Space Planning for Autonomous Navigation in Unknown Environments”, Autonomous Robots, special issue on active perception, 2017.

[13] D. Kopitkov and V. Indelman, “Computationally Efficient Belief Space Planning via Augmented Matrix Determinant Lemma and Re-Use of Calculations”, IEEE Robotics and Automation Letters (RA-L), 2(2):506-513, 2017.

[14] T. Regev and V. Indelman, “Decentralized Multi-Robot Belief Space Planning in Unknown Environments via Identification and Efficient Re-Evaluation of Impacted Paths”, Autonomous Robots, special issue on Online Decision Making in Multi-Robot Coordination, 42(4): 691-713, 2017.

[15] D. Kopitkov and V. Indelman, “No Belief Propagation Required: Belief Space Planning in High-Dimensional State Spaces via Factor Graphs, Matrix Determinant Lemma and Re-use of Calculation”, International Journal of Robotics Research (IJRR), 36(10): 1088-1130, 2017.

[16] S. Pathak*, A. Thomas and V. Indelman, “A Unified Framework for Data Association Aware Belief Space Planning and Perception”, International Journal of Robotics Research (IJRR), 32(2-3): 287-315, 2018.

[17] M. Chojnacki and V. Indelman, “Vision-based Dynamic Target Trajectory and Ego-motion Estimation Using Incremental Light Bundle Adjustment”, International Journal of Micro Air Vehicles (SAGE), Special Collection on Estimation and Control for MAV Navigation in GPS-denied Cluttered Environments, 10(2): 157-170, 2018.

[18] V. Ovechkin and V. Indelman, “BAFS: Bundle Adjustment with Feature Scale Constraints for Enhanced Estimation Accuracy”, IEEE Robotics and Automation Letters (RA-L), 3(2), April 2018.

[19] V. Tchuiev and V. Indelman, “Inference over Distribution of Posterior Class Probabilities for Reliable Bayesian Classification and Object-Level Perception", IEEE Robotics and Automation Letters (RA-L), 3(4): 4329-4336, 2018.

[20] D. Kopitkov and V. Indelman, “General Purpose Incremental Covariance Update and Efficient Belief Space Planning via Factor-Graph Propagation Action Tree”, International Journal of Robotics Research (IJRR), 38(14): 1644-1673, 2019.

[21] V. Tchuiev and V. Indelman, “Distributed Consistent Multi-Robot Semantic Localization and Mapping”, IEEE Robotics and Automation Letters (RA-L), 5(3): 4649-4656, July 2020.

[22] Y. Feldman and V. Indelman, “Spatially-Dependent Bayesian Semantic Perception under Model and Localization Uncertainty”, Autonomous Robots, 44, 1091–1119, July 2020.

[23] K. Elimelech and V. Indelman, “Efficient Modification of the Square Root Matrix on Variable Reordering”, IEEE Robotics and Automation Letters (RA-L), 6(2): 675-682, April 2021.

[24] M. Shienman, A. Kitanov* and V. Indelman, “FT-BSP: Focused Topological Belief Space Planning”, IEEE Robotics and Automation Letters (RA-L), 6(3): 4744-4751, July 2021.

Submitted Papers:

[1] E. Farhi and V. Indelman, “Bayesian Incremental Inference Update by Re-using Calculations from Belief Space Planning: A New Paradigm”, Autonomous Robots, submitted.
Preprint: https://arxiv.org/pdf/1908.02002.pdf

[2] K. Elimelech and V. Indelman, “Efficient Decision Making and Belief Space Planning using Sparse Approximations”, International Journal of Robotics Research, conditionally accepted (under revision).
Preprint: https://arxiv.org/pdf/1909.00885.pdf

[3] A. Kitanov* and V. Indelman, “Von Neumann Entropy Induced Efficient Information-theoretic Belief Space Planning”, International Journal of Robotics Research, submitted.

[4] E. Farhi and V. Indelman, “iX-BSP: Incremental Belief Space Planning”, International Journal of Robotics Research, submitted.
Preprint: https://arxiv.org/pdf/2102.09539.pdf

[5] V. Tchuiev and V. Indelman, “Epistemic Uncertainty Aware Semantic Localization and Mapping for Inference and Belief Space Planning”, Autonomous Robots, submitted.
Preprint: https://arxiv.org/pdf/2105.12359.pdf

[6] K. Elimelech and V. Indelman, “Efficient Belief Space Planning in High-Dimensional State Spaces using PIVOT: Predictive Incremental Variable Ordering Tactic”, International Journal of Robotics Research, invited submission to IJRR Special Issue on ISRR 2019, submitted.

Book Chapters

[1] V. Indelman and F. Dellaert, “Incremental Light Bundle Adjustment: Probabilistic Analysis and Extension to Robotic Navigation”, in edited collection “New Developments in Robot Vision”, Cognitive Systems Monographs Volume 23, Springer Berlin Heidelberg, 111-136, 2015.

[2] E. Nelson, V. Indelman, N. Michael and F. Dellaert, “An Experimental Study of Robust Distributed Multi-Robot Data Association from Arbitrary Poses”, in edited collection “Experimental Robotics, the 14th International Symposium on Experimental Robotics”, Springer Tracts in Advanced Robotics 109, 323-338, 2016.

[3] V. Indelman, L. Carlone and F. Dellaert, “Towards Planning in Generalized Belief Space”, in edited collection “Robotics Research, The 16th International Symposium ISRR”, Springer Tracts in Advanced Robotics 114, 593-609, 2016.

[4] V. Indelman, “Towards Cooperative Multi-Robot Belief Space Planning in Unknown Environments”, Robotics Research, Springer Proceedings, in Advanced Robotics 2, DOI 10.1007/978-3-319-51532-8_27, 2018.

[5] X. Yan, V. Indelman, B. Boots, “Incremental Sparse GP Regression for Continuous-time Trajectory Estimation & Mapping”, Robotics Research, Springer Proceedings, in Advanced Robotics 2, DOI 978-3-319-60916-4_31, 2018.

[6] K. Elimelech and V. Indelman, “Fast Action Elimination for Efficient Decision Making and Planning Using Revenue Approximation”, Robotics Research, Springer Proceedings, in Advanced Robotics 10, DOI 10.1007/978-3-030-28619-4_58, 2020.

Refereed Papers in Conference Proceedings

Published:

[1] V. Indelman, P. Gurfil, E. Rivlin and H. Rotstein, “Navigation Performance Enhancement Using Rotation and Translation Measurements from Online Mosaicking", AIAA Guidance, Navigation and Control Conference, Hilton Head, SC, USA, August 2007.

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Preprint: https://arxiv.org/abs/2105.14239

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[2] V. Indelman, L. Carlone and F. Dellaert, "Towards Planning in Generalized Belief Space with Applications to Mobile Robotics", The 4th Israeli Conference on Robotics (ICR), Tel Aviv, Israel, November 2013.

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[4] X. Yan, V. Indelman, B. Boots, "Incremental Sparse GP Regression for Continuous-time Trajectory Estimation and Mapping", in Workshop on Autonomously Learning Robots, Neural Information Processing Systems (NIPS), Quebec, Canada, December 2014.

[5] V. Indelman, "On Multi-Robot Active Collaborative Inference in Unknown Environments via Belief Space Planning", workshop on Principles of Multi-Robot Systems, in conjunction with Robotics Science and Systems (RSS) conference, Rome, Italy, July 2015.

[6] V. Indelman, "Distributed Perception and Estimation: a Short Survey", workshop on Principles of Multi-Robot Systems, in conjunction with Robotics Science and Systems (RSS) conference, Rome, Italy, July 2015.

[7] V. Indelman, “On Decision Making and Planning in the Conservative Information Space - Is the Concept Applicable to Active SLAM?”, workshop on the Problem of Mobile Sensors: Setting future goals and indicators of progress for SLAM, in conjunction with Robotics Science and Systems (RSS) conference, Rome, Italy, July 2015.

[8] D. Kopitkov and V. Indelman, “Computationally Efficient Active Inference in High-Dimensional State Spaces", workshop on AI for Long-term Autonomy, in conjunction with IEEE International Conference on Robotics and Automation (ICRA), Stockholm, Sweden, May 2016.

[9] S. Pathak*, A. Thomas, A. Feniger* and V. Indelman, “Towards DA-BSP: Data Association Aware Belief Space Planning for Robust Active Perception”, workshop on AI for Long-term Autonomy, in conjunction with IEEE International Conference on Robotics and Automation (ICRA), Stockholm, Sweden, May 2016.

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[13] D. Kopitkov, X. Yan, J. Dong, B. Boots and V. Indelman, “iLBA-GP: Incorporating Sparse Gaussian Process Regression within Incremental Light Bundle Adjustment”, The 5th Israeli Conference on Robotics (ICR), Herzliya, Israel, April 2016.

[14] A. Thomas, S. Pathak* and V. Indelman, “Robust Active Perception for Belief Space Planning in Perceptually Aliased and Uncertain Environments”, The 5th Israeli Conference on Robotics (ICR), Herzliya, Israel, April 2016.

[15] V. Ovechkin and V. Indelman, “BAFS: Bundle Adjustment with Feature Scale Constraints for Enhanced Estimation Accuracy”, Israeli Navigation Workshop, January 2018.

[16] Y. Feldman and V. Indelman, “Towards Robust Autonomous Semantic Perception”, Workshop on Representing a Complex World: Perception, Inference, and Learning for Joint Semantic, Geometric, and Physical Understanding, in conjunction with IEEE International Conference on Robotics and Automation (ICRA), Brisbane, Australia, May 2018.

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[19] A. Kitanov* and V. Indelman, “Focus on What Matters: Topological Aspects in Information-Theoretic Belief Space Planning”, Workshop on Topological Methods in Robot Planning, in conjunction with the IEEE International Conference on Robotics and Automation (ICRA), Montreal, Canada, May 2019.

[20] K. Elimelech and V. Indelman, “PIVOT: Predictive Incremental Variable Ordering Tactic for Efficient Belief Space Planning”, Workshop on Toward Online Optimal Control of Dynamic Robots, in conjunction with the IEEE International Conference on Robotics and Automation (ICRA), Montreal, Canada, May 2019.

[21] E. Farhi and V. Indelman, “Tear Down that Wall: Calculation Reuse Across Inference and Belief Space Planning”, Workshop on Toward Online Optimal Control of Dynamic Robots, in conjunction with the IEEE International Conference on Robotics and Automation (ICRA), Montreal, Canada, May 2019.

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Additional Pre-Prints and Technical Reports

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Patents

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