

R É S U M É

Per-Olof Gutman

Date & place of birth:	May 21, 1949, Höganäs, Sweden
Citizen:	Sweden, Israel
Date of immigration to Israel:	December 19, 1982
Marital Status:	Married + 4
Languages:	Swedish, English, Polish, Hebrew, German, Russian, French, Italian, (Spanish, Swahili, Arabic)
Army service:	Swedish Army Language School 1967-68 + reserve duty until 1982. Final rank: Lieutenant. Israeli Navy: 1986 + reserve duty until 2001. Rank: Private.
Web site:	https://cee.technion.ac.il/en/members/gutman/

ACADEMIC DEGREES

B.Sc.	Aug 1973	School of Engineering Physics, Lund Institute of Technology, Lund, Sweden (Sektionen för Teknisk Fysik, Lunds Tekniska Högskola).
M.Sc.	Jun 1977	Dept. of Engineering Systems, University of California, Los Angeles, U.S.A.
Ph.D.	Mar 1982	Automatic Control, School of Engineering Physics, Lund Institute of Technology, Lund
Docent ¹	April 1988	(British equivalent: Honorary Research Fellow) Dept. of Automatic Control, School of Eng. Physics, Lund Inst. of Technology, Lund.

¹ The title of docent is the second highest grade in the Swedish academic system; the highest is (full) professor. A docent qualification is required of all head doctoral student supervisors. For conferment of the title, there is a requirement that the researcher has a good overview of his/her research area and has demonstrated both the ability to formulate research problems and to independently carry through research programs. It is a requirement that the researcher should be able to lead research projects. The researcher must have substantial scientific research experience and be well published in scientific journals.

ACADEMIC APPOINTMENTS

2017 ² -	Professor emeritus ³	Faculty of Civil and Environmental Engineering, Technion, Haifa.
2016 - 2017	Chaired professor	Holder of the Beatrice Sensibar Chair in Environmental Engineering, Faculty of Civil and Environmental Engineering, Technion, Haifa.
2008	Guest professor	Department of Signals and Systems, Chalmers University of Technology, Göteborg, Sweden.
2007- 2016	Professor	Faculty of Civil and Environmental Engineering, Technion, Haifa.
2005 – 2006	Visiting Professor ⁴	Dipartimento di Ingegneria, Università del Sannio, Benevento, Italy (sabbatical year).
1998– 2007	Associate Prof.	Faculty of Civil and Environmental Engineering, Technion, Haifa (until 2002 with the Fac. of Agricultural Engineering)
1995-1996	Directeur de recherche CNRS associé/ Professeur associé ⁵	Laboratoire d'Automatique de Grenoble, ENSIEG/INPG, Grenoble, France (sabbatical year).
1989	Professor	Selected, in an international competition, as Professor of Automatic Control at the Norwegian Institute of Technology, Trondheim. Position declined due to personal reasons.
1988 - 2008	Guest professor/ Docent	Division of Optimization & Systems Theory, Department of Mathematics, Royal Institute of Technology, Stockholm, Sweden. (1-2 months/year)

² Technion has a mandatory faculty retirement age on the 1 October following the 68th birthday.

³ At the Technion, Professor Emeritus is an academic appointment approved by the Technion Senate, like all other academic appointments. The appointment is not automatic.

⁴ The title “Visiting Professor” was approved by Prof. Luigi Glielmo, Dean, Dipartimento di Ingegneria, Università del Sannio. The position was financed by the European Union Marie Curie Transfer of Knowledge Program.

⁵ “Directeur de recherche CNRS associé” during the first part of my stay, “Professeur associé”, paid by INPG, during the second part. Here “associé” means that I was considered as a “directeur de recherche CNRS” and “Professeur”, respectively, but for a period limited to my stay in France. Source Prof. Luc Dugard, ex-head of Laboratoire d'Automatique de Grenoble.

1988-1998	Senior Lecturer	Faculty of Agricultural Engineering, Technion, Haifa.
1987	Adj. Lecturer	Faculty of Electronic Systems, Tel Aviv University, Tel Aviv.
1984-1986	Adj. Lecturer	Faculty of Electrical Engineering, Technion.
1984	Adj. Lecturer	Department of Applied Mathematics, Weizmann Institute of Science, Rehovot.
1983-1984	Research Assoc.	(Amit Mekhkar). Faculty of Electrical Engineering, Technion, Haifa.
1982-1983	Univ. Lecturer	Department of Automatic Control, Lund Institute of Technology, Lund, Sweden.

PROFESSIONAL EXPERIENCE

2022 -	Consultant: Libira, Haifa. Control of coffee roasting.
2020 -	Applied Materials, Rehovot. Servo and positioning control.
2020	Coloreel, Jönköping, Sweden. Control of multi-color thread coloring.
2019	Consultant: Rafael Advanced Defense Systems Ltd., Leshem. Development of control system for a new type of stabilized platform.
2018 - 2020	Consultant : Eyeway Vision Ltd, Or Yehuda. Control of laser beam for Augmented Reality Goggles.
2016-2017	Visiteur Scientifique: IFP Énergies Nouvelles, Solaise, France (sabbatical).
2009-2010	Ingénieur/Chercheur: Commissariat à l'énergie atomique; CEA-LIST DIASI/Interactive Robotics Laboratory, Fontenay-aux-Roses, France (sabbatical year).
2006-2007	Research consultant with Volvo Construction Equipment Ltd, Eskilstuna, Sweden, with Royal Institute of Technology, Stockholm.
2005	Consultant: RaySat Ltd, Lod. Control of mobile satellite antennas.
2004	Consultant: Aelis Photonics Ltd, Natanya. Automatic control for optical filters.

2003	Consultant: MES Ltd, Ceasarea. Signal processing for optical sperm measurements.
2002	Consultant: Applied Materials Inc., Rehovot. Active Scanning Electron Microscope noise cancellation.
2001	Consultant: Smart Robotics Ltd., Lavon. Window cleaning robots.
2001	Consultant: Oraccess Ltd., Natanya. Free space optics communication.
2000	Consultant. Siemens-Elcoma AB, Stockholm. Respirator development.
1996-2001	Consultant: Zen Research Ltd, Ramat Gan. Optical storage technology.
1994-1999	Consultant: El-Op Electro-Optics Industries, Rehovot. Line-of-sight stabilization. Stabilized platform modeling and simulation. Development of algorithms for computer aided control design. Control Systems Design training.
1994	Consultant: Orbot Instruments, Yavne. Auto-focus algorithms.
1993	Consultant: KLA, Migdal Haemek: Stabilization of inspection table.
1993	Consultant: Servotech, Rishon le Zion: Robust robot control.
1991	Consultant: ACS, Migdal Haemek: Digital control algorithms for motion controller.
1990	Consultant: AAA, Ashdod: Automatic inspection machine for bottling plants.
1989-90	Scientist: Control Systems Section, El-Op Electro-Optics Industries, Rehovot, Israel.
1984-89	Senior Expert/Scientist: Control Systems Section, El-Op Electro-Optics Industries, Rehovot, Israel: Line-of-sight stabilization with mirrors and optical wedges, stabilized platforms and guns, scanners, trackers and high precision servo loops.

RESEARCH INTERESTS

Control of constrained uncertain systems with non-differentiable non-linearities; Robust and Adaptive control, including identification and computer aided control systems design; Optimal control; Control Applications in Agricultural and Environmental Engineering, including field robotics, greenhouse control and control of water and waste water systems; Process control (paper machines, aero-electric power station); Control of autonomous vehicles, including off-road vehicles and naval vehicles; Traffic control.

TEACHING EXPERIENCE

“Linear Systems”. Undergraduate. Faculty of Mechanical Engineering, Technion, Haifa, in English for the Technion International School (fall semester 2019).

“Model Predictive Control and Interpolating Control”. Undergraduate/graduate: College of Engineering and Computer Science, Australian National University, Canberra, Australia (July-September 2017); Continued education course: Rafael Advanced Defense Systems Ltd., Akko (September – December 2018); Graduate: Department of Mechanical Engineering, Ben Gurion University, Beer-Sheva (spring semester 2019, fall semester 2022).

“Introduction to Control II”: Undergraduate: Faculty of Civil and Environmental Engineering, Technion, Haifa (2015).

“Systems engineering”. Undergraduate: Department of Signals and Systems, Chalmers University of Technology, Göteborg, Sweden (2008).

“Systems Analysis”. Undergraduate. Faculty of Civil and Environmental Engineering, Technion, Haifa (2003-2016). Also in English for the Technion International School (2011-2016).

“Introduction to Control I”: Undergraduate: Faculty of Civil and Environmental Engineering, Technion, Haifa (2003-2005, 2014).

“Control Project”. Undergraduate. Faculty of Civil and Environmental Engineering, Technion, Haifa (2001-2016).

“Control Laboratory”; Undergraduate: Faculty of Agricultural Engineering, Technion, Haifa (1999-2002), Faculty of Civil and Environmental Engineering, Technion, Haifa (2002-2015).

“Robust control design with QFT”: Graduate: El-Op Electro-Optical Industries, Rehovot (1998); Laboratoire d’Automatique de Grenoble, ENSIEG, Grenoble, France (1996); Royal Institute of Technology, Stockholm, Sweden (1996, 1999, 2002, 2005); Linköping University, Sweden (2003), Lund University, Sweden (2004); Università del Sannio, Benevento, Italy (2005); Chalmers University of Technology, Göteborg, Sweden (2007), CEA, Fontenay-aux-Roses, France (2009). Faculty of Mechanical Engineering, Technion (2020).

“Multivariable control design”: Graduate: Missile division of RAFAEL - Weapons Development Authority, Haifa (1994).

“Control Systems Design”: Undergraduate/graduate: Faculty of Agricultural Engineering, Technion, Haifa (1991-2002). Faculty of Civil and Environmental Engineering, Technion, Haifa (2002-2016).

“Introduction to Control”: Undergraduate: Faculty of Agricultural Engineering, Technion, Haifa (1989-2002). Faculty of Civil and Environmental Engineering, Technion, Haifa (2002-2003, 2006-2013).

“Systems and Control”: Undergraduate/graduate: Faculty of Agricultural Engineering, Technion, Haifa (1990-2002). Faculty of Civil and Environmental Engineering, Technion, Haifa (2002-2016).

“Optimal Control”: Graduate: Department of Electronic Systems, Tel Aviv University, Tel Aviv (1987).

Seminars on “Computer Aided Control Systems Design and Analysis” for undergraduate and graduate students: Department of Electrical Engineering, Technion, Haifa (1984-86).

“Adaptive Control”: Graduate: Department of Applied Mathematics, Weizmann Institute of Science, Rehovot (1984).

“Signals and Systems”: Undergraduate: Faculty of Electrical Engineering, Technion, Haifa (1983-84).

“Extension Course in Automatic Control for Engineers in Industry”: Graduate: Department of Automatic Control, Lund Institute of Technology, Lund, Sweden (1982)

“Automatic Control for Chemical Engineering Students”: Undergraduate: Department of Automatic Control, Lund Institute of Technology, Lund, Sweden (1981).

“Patterns of Problem Solving”: Undergraduate: Department of Engineering Systems, University of California, Los Angeles, U.S.A. (1977-78).

High school Mathematics teacher at Pugu Secondary School, Dar-es-Salaam, Tanzania, employed by the Swedish International Development Authority (1973-75).

TECHNION ACTIVITIES

1992-93	Representative of the Faculty of Agricultural Engineering to the Technion Computer Committee.
1996 - 2002	Representative of the Faculty of Agricultural Engineering to the Technion Interdept. Committee for Quality Assurance.
1999	Member of the Faculty of Agricultural Engineering Dean Election Search Committee.
2001 - 2002	Co-ordinator of the Graduate Studies Committee of the Faculty of Agricultural Engineering, including representation to the Technion General M.E. program Committee.
2002 - 2005	Representative of the Faculty of Civil and Environmental Engineering to the Technion Interdepartmental Committee for Quality Assurance.

- 2002 Co-founder of the Swedish Technion Society, First Chair: Prof. Anders Lindquist, Royal Inst Technology, Stockholm.
- 2002 - Member of the board of the Swedish Technion Society.
- 2003 - 2005 Representative of the Faculty of Civil and Environmental Engineering to the Technion General M.E. program Committee.
- 2007 - 2009 Representative of the Faculty of Civil and Environmental Engineering to the Technion Computer Committee.
- 2010 - 2013
- 2008 - 2009 Member of the Technion Senate Permanent Committee for Undergraduate and Graduate Studies.
- 2012 - 2017 Member of the Technion Automotive M.E. Program Committee
- 2014 - 2016 Head of the Division of Environmental, Water, and Agricultural Engineering in the Faculty of Civil and Environmental Engineering.
- 2014 - 2016 Member of the Technion Senate.

PUBLIC PROFESSIONAL ACTIVITIES

- 1981 - Reviewer for the following journals: IEEE Trans. on Automatic Control, Automatica, IEEE Trans. on Control Theory and applications, IEEE Trans. on Circuits and Systems, ASME Jour. of Dynamic Systems, Measurements & Control, IEE Journal D (Control), Int. J. Adapt Contr. & Signal Proc., Optimal Control Appl. and Methods, J. on Agricultural Engineering Research, SIAM J. of Control and Optimization, J. Food Engineering, Mathematics and Computers in Simulation, J. Process Control.
- 1985 Organized 1-day workshop on “Non-linear Control” for the Israel Association for Automatic Control.
- 1986 Organized a one-day workshop on “Feedback Control Design with the Horowitz Method” for the Israel Association for Automatic Control.
- 1988 Organized a two-day workshop on “Robust Feedback Control Design: the Horowitz Method” for Institute of Electrical and Electronics Engineers, USA, at the 27th Conference on Decision and Control, Austin, Texas.
- 1997 Organized a one-day workshop on “Robust Control with QFT” for the Israel Association for Automatic Control.

- 1997- Member of the International Federation of Automatic Control (IFAC) Technical Committee on Modeling and Control in Agricultural Processes.
- 1999 Organized the annual Israel Association for Automatic Control Graduate Control Students' Seminar Day.
- 1999 Organizing a one-day workshop on "Vehicle and Traffic Control" for the Israel Association for Automatic Control.
- 1999 Expert Evaluator for the European Commission CRAFT program.
- 2001 Evaluator of research proposals for the Swedish Council for Scientific Research.
- 2002-2003 Guest editor of *Mathematics and Computers in Simulation*.
- 2002-2005 Associate Editor of *Automatica* which is the main journal of the International Federation of Automatic Control.
- 2002- Member of the State of Israel Ministry of Agriculture (Chief Scientist Office) Steering Committee on Greenhouse Technologies.
- 2004 Expert Evaluator for the European Commission CRAFT program (under the 6th framework).
- 2004 - 2009 On the Board of the Israeli Association for Automatic Control.
- 2005 Co-organized 1-day workshop on "Model Predictive Control" for the Israel Association for Automatic Control.
- 2008 - Evaluator for the Israel Science Foundation (Electrical Engineering)
- 2009 Expert Evaluator for the European Commission FP7 program.
- 2011 - 2016 President of the Israeli Association for Automatic Control.
- 2012 Evaluator for the US-Israel Binational Science Foundation

MEMBERSHIP IN PROFESSIONAL SOCIETIES

- 1979 – 1999 Institute of Electrical and Electronics Engineers, U.S.A.
- 1999 – 2014 Senior Member, Institute of Electrical and Electronics Engineers, U.S.A.
- 2014 – Life Senior Member, Institute of Electrical and Electronics Engineers, U.S.A.

HONORS

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| 1968-69 | World Union of Jewish Students Undergraduate Year Scholarship for studies at the Hebrew University, Jerusalem. |
| 1976-78 | A Fulbright grant, a scholarship from the Sweden-America Foundation, Stockholm, and grants from various Swedish and American private foundations, for studies at the University of California, Los Angeles. |
| 1995 | First prize, Third European Control Conference Benchmark Design Competition, Rome, Sept. 1995 |
| 2005 | Second prize, ABB Robot Control Competition, Västerås, Sweden. |

POST-DOCTORAL STUDENTS

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| 1991-93 | Salomon Oldak | Host: Gutman. Oldak got his Ph.D. at the Department of Mathematics, Weizmann Institute of Science, Rehovot, Israel. Journals: [15], [18]. Present occupation: Associate Professor of Electrical Engineering, California State Polytechnic University, Pomona, California. |
| 1995-97 | Daniele Galardini | Host: Prof. Anders Lindquist, Department of Mathematics, Royal Institute of Technology, Stockholm, Sweden. Co-host: Gutman. Galardini earned his Ph.D. at the Université catholique de Louvain, Belgium. Conference: [30]. Present occupation: R&D, TRASYS Space, Bruxelles, Belgium. |
| 1998 | Jonas Sjöberg | Host: Gutman. Sjöberg got his Ph.D. from the Department of Electrical Engineering, Linköping University, Linköping, Sweden. Conference: [45]. Journal: [62]. Present occupation: Professor, Department of Signals and Systems, Chalmers University of Technology, Göteborg, Sweden. |

2000-2001	Marco Ivan Ramirez Sosa Moran	Host: Prof. Ido Seginer, Co-host: Gutman. Got his Ph.D. from Departamento de Ingeniería Eléctrica, CINVESTAV, México, D.F., México. Conference: [71]. Present occupation: Senior Lecturer, Department of Engineering, University of Westminster, London, Great Britain.
2012 - 2014	Hoai-Nam Nguyen	Host: Gutman. Got his Ph.D. from Supélec, Gif-sur-Yvette, France. Conference: [105, 106, 109-111, 117, 120, 122-124, 127, 129-131, 135, 136, 141, 145, 148]. Journal: [79, 83, 88, 92, 93, 95]. Present occupation: Researcher at IFPEN, Lyon.
2017 - 2018	Pedro Mercader	Hosts: Assistant Prof. Jack Haddad, and Gutman. Got his Ph.D. from University of Murcia, Murcia, Spain. Conference: [152].

DOCTORAL STUDENTS

Completed Theses

1992	Uri Ben-Hanan	Ph.D. Primary supervisor: Prof. K. Peleg. Additional supervisor: Gutman. Thesis: "Optimal classification by time variable features." Journals: [12], [17]. Conference: [17]. Present occupation: Professor at the Mechanics Eng Dept., ORT Braude College, Carmiel, Israel
1993	Claudio Baril	Ph.D. Primary supervisor: Gutman. Thesis: "Control of mechanical systems affected by friction and other nondifferentiable nonlinearities." Journals: [15], [16], [23]. Conferences: [13], [14], [15], [20]. Present occupation: Private business, Bahia Blanca, Argentina.
1996	Noam Galperin	Ph.D. Primary supervisor: Gutman. Supervisor during Gutman's sabbatical 1995-96: Prof. A. Feuer. Thesis: "Modeling and identification of uncertain systems using Lissajou figures." Journal: [24]. Conferences: [27, 31]. Present occupation: Rafael Advanced Defence Systems, Haifa, Israel.

1999	Rafael Linker	Ph.D. Primary supervisor: Prof. I. Seginer. Additional supervisor: Gutman. Thesis: "Fault detection and identification in greenhouses". Journals: [28], [32]. Conferences: [35], [37], [44], [49], [51], [62]. Present occupation: Associate Professor, Civil and Environmental Eng., Technion, Haifa, Israel.
2000	Mattias Nordin	Ph.D. Primary supervisor: Prof. A. Lindquist, Royal Inst. of Technology, Stockholm. Additional supervisor: Gutman. Thesis: "Nonlinear backlash compensation for speedcontrolled elastic systems". Journals: [20], [22], [34], [48]. Conferences: [22], [23], [24], [25], [30], [52]. Present occupation: VP R&D, Atlas Copco, Örebro, Sweden.
2005	Gianantonio Bortolin	Ph.D. Primary supervisor: Prof. A. Lindquist, Royal Inst. of Technology, Stockholm. Additional supervisor: Gutman. Thesis: "Modelling and identification of curl and twist in paper manufacturing. Journal [47]. Conference: [79]. Present occupation: R&D, ZF Friedrichshafen AG, Germany.
2010	Jack Haddad	Ph.D. Primary supervisor Prof. David Mahalel, co-supervisor: Gutman. Thesis: "Optimal Control for Isolated Signalized Intersections". Paper: [70-72, 81, 82]. Conference: [90, 92, 103]. Present occupation: Assistant Professor, Faculty of Civil and Environmental Engineering, Technion.
2014	Arkadi Lichtsinder	Ph.D. Supervisor: Gutman. "Reciprocity of friction and backlash in servo control systems". Paper: [86]. Conferences: [94, 101]. Present occupation: Rafael Advanced Defence Systems, Haifa.
2018	Arie Schreiber	Ph.D. Supervisor: Gutman. Additional supervisor: Prof. Tal Shima, Technion. Thesis: "Development and Implementation of Robust Roll-Over Avoidance Control Algorithm for a Four-wheeled Laboratory Vehicle".

2019	Daniel Rubin	Ph.D. Supervisor: Gutman. Additional supervisor: Dr. Mario Jodorkovski, General Motors, Herzliya. "Novel Vehicle Active Suspension Applications for Lateral Disturbances Attenuation and Safety". Present occupation: General Motors, Herzliya.
2021	Anna Clarke	Ph.D. Supervisor: Gutman. "An Automatic Control System for Training Complex Kinesthetic Skills." Present occupation: Mobileye, Jerusalem.
2021	Ayal Taitler	Ph.D. Supervisor: Prof. Erez Karpas. Co-supervisor: Gutman. "A Method for Combined Planning and Control for Hybrid Domains".

Theses in Progress

2025	Sergey Nazarov	Ph.D. Supervisor: Prof. Yehuda Agnon. Co-supervisor: Gutman. "A Ship-based Autonomous Helicopter as a Sensor for Atmospheric Turbulence Measurement and Modelling"
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M.SC. AND LICENTIATE⁶ STUDENTS

Completed Theses

1995	Bnyahu Cohen	M.Sc. Primary supervisor: Gutman. Thesis: "Development of efficient algorithms and their implementation in a computer program for robust control design." Journal: [48], Conference: [23]. Present occupation: Head of R&D, MES Medical Electronic Systems, Ceasarea, Israel.
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⁶ The Swedish Licentiate of Engineering is an intermediate post-graduate degree, and can be seen as an academic step halfway between a 4.5 year undergraduate degree and a PhD. The program for a Licentiate degree is equivalent to a total of two years of full-time study for those who are awarded a doctoral position. For the Licentiate thesis, 2-3 peer-refereed articles (or an equivalent monograph) is usually required, with no requirement for original research per se, and the Ph.D.-thesis is usually a continuation containing original research.

1995	Rafael Linker	M.Sc. Primary supervisor: Prof. I. Seginer. Additional supervisor: Gutman. Thesis: "Simultaneous CO2 enrichment and ventilation of greenhouses." Journals: [26], [27]. Conference: [26], [32]. Continued with Ph.D., see above.
1998	Alex Liberzon	M.Sc. Primary supervisor: Dr. D. Rubinstein. Additional supervisor: Gutman. Thesis: "Adaptive suspension system of a high mobility track vehicle". Journal: [31]. Conferences: [34], [38], [39]. Present occupation: Professor, Tel Aviv University.
1998	Jens Pettersson	Licentiate. Primary supervisor: Prof. B. Wahlberg, Royal Inst. of Technology, Stockholm. Additional supervisor: Gutman. Thesis: "On model-based estimation of quality variables for paper manufacturing". Journal: [41]. Occupation before death: R&D, ABB Corporate Research, Västerås, Sweden.
2002	Eran Horesh	M.Sc. Primary supervisor: Gutman. Additional supervisor: Dr. Rami Guetta, Faculty of Agricultural Engineering, Technion. Topic: "Control of aero-electric power station". Journal: [36]. Conference: [55]. Present occupation: Lecturer, Ort Braude College, Karmiel, Israel.
2002	Amit Serebrennikov	M.Sc. Primary supervisor: Dr. N. Shimkin, Faculty of Electrical Engineering, Technion. Additional supervisor: Gutman. Topic: "Navigation and guidance of a man-tracking vehicle". Conference: [47]. Present occupation: R&D, Elbit Systems, Haifa, Israel.
2002	Nahum Medlinger	M.Sc. Supervisor: Gutman. Topic: "Roll-over avoidance control for off-road vehicles". Present occupation: R&D, Rafael Ltd, Akko, Israel.
2002	Gianantonio Bortolin	Licentiate. Primary supervisor: Prof. A. Lindquist, Royal Inst. of Technology, Stockholm. Additional supervisor: Gutman. Thesis: "On modeling and estimation of curl and twist in multi-ply paper board". Journal: [39]. Conference [54]. Continued with Ph.D., see above.

2006	Ilan Selig	M.Sc. Primary supervisor: Gutman. Additional supervisor: Dr. D. Rubinstein. Topic: "Steering and stability control of off-road autonomous vehicles". Present occupation: Applied Materials., Rehovot, Israel.
2006	Christelle Gaillemard	Licentiate. Primary supervisor: Prof. A. Lindquist, Royal Inst. of Technology, Stockholm. Additional supervisor: Gutman. Thesis: "Modelling of the drying section of a paper machine". Present occupation: R&D, MathCore Ltd., Linköping, Sweden.
2006	Eyal Omer	M.Sc. Supervisor: Gutman. Thesis: "Optimal design and operation of 'Energy Tower' combined with pumped storage and desalination". Journal papers: [54], [56]. Present occupation: R&D, Tahal, Tel Aviv, Israel.
2008	Yaron Greenhut	M.Sc. Supervisor: Gutman. Thesis: "Sensor fusion of GPS with omni-directional image registration for off-road autonomous vehicle path tracking." Present occupation. Elbit, Haifa, Israel.
2008	Uri Nenner	M.Sc. Supervisor Dr. Raphael Linker, Co-supervisor: Gutman. Thesis: Control of an unmanned motorcycle robot. Journal paper: [65]. Conference: [83]. Present occupation: start-up entrepreneur.
2014	Yaron Zimmerman	M.Sc. Primary supervisor: Gutman. "A method for optimization based, high order controller auto-tuning." Journal: [82]. Conference [129]. Present occupation: Owner of Spectrum Engineering (consultancy firm).
2015	Eliya Shaviv	M.Sc. Primary Supervisor: Prof. Amir Landsberg, Faculty of Biomedical Engineering, Technion. Additional supervisor: Gutman. "Modeling and Analysis of the Integrated Work of a Synchronized Cardiac Assist Device and the Failing Heart". Present occupation: Rewalk, Yokneam.
2015	Ari Berger	M.Sc. Primary supervisor: Gutman. "A novel approach to nano position control system design towards a 450mm wafer inspection X-Y stage." Conference [140]. Journal [89]. Present occupation: Independent consultant.

2017	Shahar Adar	M.Sc. Primary supervisor: Gutman. Additional supervisor: Prof. Ilya Ioslovich, Vatat. Avodat Gmar: "Unmanned Surface Vehicle (USV) path planning in dynamic obstacles environment." Present occupation: Rafael, Leshem.
2019	Doron Gur	M.Sc. Primary Supervisor: Gutman. "AUV modeling and MIMO control design". Present occupation: Elmo, Ramat Hasharon.
2023	Guy Rotem	M.Sc. Primary supervisor: Assoc. Prof. Erez Karpas, Faculty of Industrial Engineering, Technion. "Hybrid Planning with Bounded Disturbances". Present occupation: Elbit, Yokneam.

RESEARCH GRANTS

1990-92	"Development of a smart motion controllers for precision systems." Ministry of Industry and Trade, Jerusalem. NIS 82701. Principal investigator: Gutman.
1992-93	"Optimal control of CO ₂ -enrichment in greenhouses for melons." MOP Arava and Ministry of Agriculture. NIS 18704. Principal investigator: Prof. Ido Seginer.
1992-94	"Development of a smart motion controllers for precision systems." French-Israeli Scientific Cooperation Program, Arc-en-Ciel. Travel grants. Principal investigators: Prof. Luc Dugard, Grenoble and Gutman.
1992-97	"Optimal environmental control for indeterminate greenhouse crops." U.S.-Israel Binational Agricultural R&D Foundation, BARD. USD 101200. Principal investigators: Prof. I. Seginer and Prof. J. Jones.
1994-95	"Optimization of air distribution in aerators for biological wastewater treatment plants". Water Research Institute. USD 10000. Principal investigators: Prof. Y. Argaman, Civil Engineering, and Gutman.
1997-98	"Optimal control methods for water allocation and recycling." Joint Hebrew University in Rehovot-Technion Research Foundation. USD 2250. Principal investigators: Gutman and Prof. E. Hochman, Rehovot.
1999	"The development of a digital controller for inertial stabilization and a system for identification of faults in the components of the controller". Research grant no 160-913, funded by RAFAEL. Principal investigators: Gutman and Dr. Moshe Idan, Aerospace Engineering, Technion.

- 2002 - 2003 "Development of a novel method for super-intensive fish farming by controlling pH at high ammonium levels". NIS 100000 from the Israel Ministry of Agriculture, together with Noam Mozes, and Dr. Benny Ron, National Center for Aquaculture, Eilat.
- 2001 - 2003 "Development of a 3D flow model for the Energy Tower and its environment for large Reynolds numbers". Israel Ministry of Infrastructure. Research grant no 2002728/9. 989000 NIS. Principal investigator: Prof. Dan Zaslowski. Co-principal investigator: Gutman.
- 2003-2007 "Adaptive Decentralized Control of Plants with Delays". Israel Science Foundation, together with Dr. Boris Mirkin, Faculty of Civil and Environmental Engineering, Technion. Research grant no 150-004. NIS 573100. Principal investigator: Gutman.
- 2003 –2005 "Design and development of the control system for the aero-electric power station". Israel Ministry of Infrastructure. Research grant no 1004-787, 2003-511. Principal investigator: Prof. Dan Zaslowski. Co-principal investigator: Gutman. NIS 530000.
- 2004 - 2006 "Off-road telerobotic vehicles", Ministry of Defence - Mafat. Research grant no 100-5129. NIS 171000. Principal investigator: Prof. Itzhak Shmulevich Faculty of Civil and Environmental Engineering, Technion. Co-principal investigator: Gutman.
- 2004 -2010 "Stabilization and control of the seeker for an inexpensive flying platform". In co-operation with Rafael Ltd. Keren Deborah. Grant no 2004387: USD 25641. The Asher Peled Munitions Fund (Technion), grant no 2010564: 6000 USD. Principal investigator: Gutman.
- 2007-2009 "Investigation of Tracking Alternatives for the Mempile Optical Disk" In co-operation with Mempile Ltd, Neve Ilan, Israel. TRDF Research grant no 2008793. USD 28000. Principal investigator: Gutman.
- 2007-2010 "Variable Structure Adaptive coordinated control of non-linear delayed systems (short title: Adaptive coordinated control with Variable Structure Systems/Sliding Mode Control.)" United-States-Israel Binational Science foundation, together with Prof. Yuri Shtessel, University of Alabama-Huntsville, and Dr. Boris Mirkin, Faculty of Civil and Environmental Engineering, Technion. Research grant no 2008-471. USD 82100.
- 2007-2012 "Coordination in adaptive decentralized control." Israel Science Foundation, together with Dr. Boris Mirkin, Faculty of Civil and Environmental Engineering, Technion. Research grant no 2008-114. NIS 812700 . Principal investigator: Gutman.
- 2008-2009 "MicroBAT stabilized payload." In co-operation with Bental Industries Ltd., Kibbutz Merom Golan, Israel. TRDF Research grant no 2011132. USD 54000. Principal investigator: Gutman.

- 2008-2011 "Roll over avoidance control for off-road vehicles". TASP – Technion Autonomous Systems Program, grant no. 907179. 90000 NIS. PI: Gutman, and Dr. Tal Shima, Technion.
- 2008-2009 "Signal processing and control for spectral derivatives." In co-operation with Derivatives - Limited Partnership, Tel-Aviv, Israel. TRDF Research grant no 2011136. USD 28000. Principal investigator: Gutman.
- 2009-2012 "Access control for the Fast Lane". In co-operation with Netivei Ayalon Ltd., Tel Aviv, Israel. Grant no 2014441 NIS 135000. Principal investigator: Gutman.
- 2009-2011 "Advanced Stabilization and Pointing of Mobile Antennas for Satellite Communication" Israel Ministry of Industry, Trade and Labor (Magnetron) in cooperation with Orbit Ltd., Natanya. TRDF Research Grant no 20114186. NIS 400000. Principal investigators: Prof. L. Mirkin, Technion and Gutman.
- 2010-2013 "Autonomous rolling ground vehicle". TASP – Technion Autonomous Systems Program, grant no. 2013801. USD 43100. Principal investigators: Prof. Tal Shima, Technion, and Gutman
- 2011-2014 "Control of bipedal robotic locomotion". TASP – Technion Autonomous Systems Program, grant no. 2015136. USD 42800. Principal investigators: Dr. Izhar Or, Technion, Prof. Miriam Zachsenhouse, Technion, and Gutman
- 2011-2012 "Open System for Tractors' autonomous operations STRATOS". EU FP7 ICT Agri era-net and Israel Ministry of Agriculture. Israeli PI: Gutman. Grant no 1009932. 500000 NIS.
- 2011-2015 "Sliding mode adaptive distributed control". US-Israel Binational Science foundation, with Prof. Yuri Shtessel, University of Alabama-Huntsville, and Dr. Boris Mirkin, Faculty of Civil and Environmental Engineering, Technion. Research grant no 2014311. USD 94000.
- 2011- "Signal Processing for Security Systems". In co-operation with Crow Ltd, Airport City, Israel. PI: Gutman. Grant no 2015697. 47878 USD.
- 2012-2015 "Coordinated Management and Control of Transportation Infrastructure Systems". Technion-Cornell Joint Research Fund, with Prof. Eyal Bitar, EE, Cornell, and Prof. David Mahalel, and Prof. Barak Fishbain, CEE, Technion. Grant no. 2017153. USD 25641.
- 2012-2017 "Development of stage position control algorithms for the 450Metro consortium". Israel Ministry of Industry and Trade Magnet program. PI: Gutman. Grant no 2017011. 1499000 NIS in total until 6/2016.

- 2012-2015 “Optimal trajectory planning and control in dynamic obstacle environments for unmanned naval vehicles”. The Asher Peled Munitions Fund at the Technion. PIs: Gutman, and Prof. Ehud Rivlin, Faculty of Computer Science, Technion. Grant no. 2018617. USD 6000.
- 2016-2017 “Adaptive traffic control based on value-of-time”. Israel Ministry of Transport and Road Safety. PI: Gutman, with Prof. David Mahalel, Technion. 61600 ILS.
- 2016-2020 “Novel Vehicle Active Suspension for Lateral Disturbances Attenuation and Safety” . General Motors Israel Ltd., PI: Gutman. 706,684.75 ILS. Grant no. 2022812.
- 2020-2023 “Hybrid Planning for Last Mile Logistics Using Trucks and Drones”. ISTRC, Technion. PIs: Prof. Erez Karpas, Gutman. USD 93000.

SIGNIFICANT PROFESSIONAL PROJECTS

- 1984-88 Development of adaptive prediction for target tracking at El-Op Electro-Optics Industries, Rehovot. Project manager: Tuvia Sprecher.
- 1985-86 Robust and adaptive control design for a beam deflector at El-Op Electro Optics Industries, Rehovot. The beam deflector got to be produced in large numbers. Project manager: Tuvia Sprecher.
- 1986-87 Digital control design for an optical wedge system at El-Op Electro-Optics Industries, Rehovot. Project manager: Avraham Huppert.
- 1987-90 Development of stabilized platform for line-of-sight stabilization, at El-Op Electro-Optics Industries, Rehovot. Project manager: Dr. Linda Neumann.
- 1989-98 Development of state-of-the-art fire control system, at El-Op Electro-Optics Industries, Rehovot. Project manager: Moshe Ilan.
- 1990-2000 Development of methods to control electro-mechanical systems with friction and backlash. Research and development at the Technion and the Royal Institute of Technology, in co-operation with various industries. Scientific project leader: Gutman.
- 1990-2006 Modelling of quality variables for paper board manufacturing. . Research and development at the Royal Institute of Technology, in co-operation with Assi-Domän Carton Board Ltd, Frövi, Sweden. Scientific project leader: Gutman.

- 1995-96 Development of the computer program “Qsyn — the Toolbox for Robust Control Systems Design for use with Matlab,” for El-Op Electro-Optics Industries, Rehovot. Project manager: Dr. Linda Neumann.
- 1997- 2001 Development of control system for optical storage, at Zen Research Ltd, Ramat Gan. Project manager: Michael Naor.

PUBLICATIONS

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Gutman, P-O, Olsson, R: "Dynamic models for wastewater treatment plants" (in Swedish: Dynamiska modeller for vattenreningsverk). Report RE-136. Undergraduate thesis, Dept. of Automatic Control, Lund Inst. Techn., Lund, Sweden, March 1974.

Gutman, P-O: "Controllers for Bilinear and Constrained Linear Systems". CODEN: LUTFD2/(TFRT-1022)/1-133/(1982). Ph.D. thesis, Dept. of Automatic Control, Lund Inst. Techn., Lund, Sweden, Feb. 1982.

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2. *9th IFAC/IFORS Symposium on Identification and System Parameter Estimation*, Budapest, Hungary, July 8-13, 1991. Invited speaker: Gutman.
3. *European Research Network on System Identification Symposium*, Stockholm, Sweden, 8 - 10 Sept., 1997. Speaker: Gutman.
4. *Robustness in Identification and Control RIC' 98*, Certosa di Pontignano, Siena, Italy, 30 July - 2 August, 1998. Gutman was meant to give an invited talk but a bicycle accident on 23 July in Haifa prevented his participation.
5. *Reglermöte 2000*. The bi-annual meeting of the Swedish Control Society. Uppsala, June 2000. Invited plenary speaker: Gutman.
6. *Robust Control Workshop*, Newcastle, Australia, December 2000. Invited speaker: Gutman.
7. *5th International Symposium on Quantitative Feedback Theory and Robust Frequency Domain Methods*, Pamplona, August 2001. Invited plenary speaker: Gutman.
8. *2003 XXX CIOSTA/CIGR V Conference on Management and technology applications to empower agriculture and agro-food systems*, 22-24 September 2003, University of Torino, Italy. Invited speaker: Gutman.
9. *Workshop on Dynamical Systems and Control. Center for Mathematical Sciences, Technion*, Haifa. 20-22 June 2004. Invited speaker: Gutman.
10. *MECHATRONICS 2006 - 4th IFAC-Symposium on Mechatronic Systems*, Heidelberg, Germany, 12-14 September 2006. Invited speaker: Gutman.
11. *IFAC VI International Workshop "Generalized Statements and Solutions of Control Problems"*, Gelendzhik, Russia, 25-27 September 2012. Invited plenary speaker: Gutman.
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111. Nguyen HN, Olaru S, Gutman P-O, Hovd M: "Constrained interpolation-based control for polytopic uncertain systems." *50th IEEE Conference on Decision and Control and European Control Conference*, Orlando, Florida, USA, December 12 – 15, 2011.
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145. Nguyen H-N, Gutman P-O: "Constrained interpolating control: The case of polyhedral invariant set for LPV discrete-time systems," *20th International Conference on Methods and Models in Automation and Robotics (MMAR)*, pp 961-4, Miedzyzdroje, Poland, 24-27 Aug 2015.
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161. Taitler A, Ioslovich I, Karpas E, Gutman PO, Ben-Asher JZ (2019): "Structural Analysis of Combined Time and Energy Optimal Trajectory Planning with Quadratic Drag." *27th Mediterranean Conference on Control and Automation (MED19)*, pp. 153-158. Akko, Israel, Jul 1-4, 2019.
162. Lichtsinder A, Gutman PO (2019): "Control Design and Analysis of Servo-System with Stick-Slip Friction and Backlash Using Novel Quasi-linear Approaches." *27th Mediterranean Conference on Control and Automation (MED19)*, pp. 183-188. Akko, Israel, Jul 1-4, 2019.
163. Clarke A, Gutman PO (2019): "Model Predictive Control for Skydiver Fall-Rate Adjustment." *27th Mediterranean Conference on Control and Automation (MED19)*, pp. 541-546. Akko, Israel, Jul 1-4, 2019.
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PARTICIPATION IN ORGANIZING CONFERENCES

- 1993 Organized the special session, "Control of systems with non-differentiable non-linearities", International Conference on Control Theory and its Applications. Jerusalem, Israel, 18-21 Oct. 1993.
- 1996 Organized (with X. Hu) the session: "Industrial Applications of Non-linear Control Theory" at The International Symposium on the Mathematical Theory of Networks and Systems, MTNS-96, St. Louis, Missouri, USA, 24-28 June 1996.

- 1997 Member of international program committee of the International Symposium on Quantitative Feedback Theory and Robust Frequency Domain Methods and Applications, University of Strathclyde, Glasgow, 21-22 August, 1997.
- 1998 Organized (with X. Hu) the session: “Industrial Applications of Non-linear Control Theory” at the International Symposium on the Mathematical Theory of Networks and Systems, MTNS-98, Padova, Italy, June 1998.
- 1997-1999 Member of the Organizing Committee of the 7th IEEE Mediterranean Conference on Control and Automation, Haifa, 28-30 June, 1999.
- 1998-1999 Member of the international program committee of the Fourth International Symposium on Quantitative Feedback Theory and Robust Frequency Domain Methods, University of Natal, Durban, South Africa, August 1999.
- 1999-2001 Chair of the Organizing Committee of the IMACS/IFAC 4th International Symposium on Mathematical Modelling and Simulation in Agricultural and Bio-Industries, Haifa, 12-14 June, 2001.
- 1999-2001 Member of international program committee of the Fifth International Symposium on Quantitative Feedback Theory and Robust Frequency Domain Methods, Public University of Navarra, Pamplona, Spain, August 2001.
- 2004 Member of the organizing committee of the First Swedish-Israeli Control Workshop, Royal Institute of Technology, Stockholm, Sweden, 27-28 September, 2004.
- 2006 Co-organized 2-day workshop on clutch control at Università del Sannio, Benevento, Italy, 25-26 May 2006.
- 2006-2007 Chair of the international program committee of the IFAC Conference Agricontrol 2007 in Croatia, 3-6 Sept 2007.
- 2006–2007 General chair of the Eighth International Symposium on Quantitative Feedback Theory and Robust Frequency Domain Methods, the Weizmann Institute, Rehovot, Israel 17-19 July 2007.

- 2008 – 2009 Member of the National Organizing Committee for the 6th IFAC Symposium on Robust Control Design – ROCOND 2009, Haifa, Israel, 16-18 June 2009.
- 2009 – 2010 Member of the International Program Committee of the 7th IFAC Symposium on Intelligent Autonomous Vehicles (IAV 2010) Lecce, Italy, September 6-8, 2010.
- 2010 Member of the organizing committee of the Informal Workshop on - Wo-man-Robot Interaction, held at CEA, LIST DIASI/ Interactive Robotics Laboratory, Fontenay-aux-Roses, France, 13-14 Sept. 2010.
- 2012 Member of the organizing committee of the Itzhack Y. Bar-Itzhack Memorial Symposium on Estimation, Navigation, and Spacecraft Control, Dan Panorama Hotel, Haifa, Israel. 14-17 October 2012.
- 2012 – 2013 Chair of the organizing committee of the Israeli Association for Automatic Control "International Symposium on Systems and Control", Technion, Haifa, 7-8 October, 2013.
- 2013 Organized and led, with S. Oлару and H-N Nguyen, the workshop “Interpolation-based techniques for constrained control: from improved vertex control to robust model predictive control alternatives” at the European Control Conference, Strasbourg, 24-27 June 2013.
- 2016 Member of the International Program Committee of the International Conference on Methods and Models in Automation and Robotics, Poland.
- 2018 Member of the International Program Committee of the 2nd IFAC Workshop on Linear Parameter Varying Systems (LPVS'18), Florianopolis, Brazil, September 3-5, 2018.
- 2018 – 2019 Member of the National Organizing Committee of the 1st IFAC Workshop on Control of Transportation Systems, Haifa, Israel, 30 June – 1 July 2019.
- 2018 – 2019 Member of the National Organizing Committee of the 27th Mediterranean Conference on Control and Automation (MED '19), Akko, Israel, July 1-4, 2019.
- 2021 Organized the Israeli Association for Automatic Control "IAAC³ – IAAC Control Conference", Technion, Haifa, 5 July 2021.