Assoc. Prof. Minas Liarokapis

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About Me

I am an Associate Professor in the Department of Mechanical and Mechatronics Engineering at the University of Auckland (Auckland, New Zealand) and Director of the New Dexterity research group (www.newdexterity.org). I am interested in equipping robots with dexterous manipulation capabilities and enabling humans to regain their lost dexterity or augment their performance, modeling, designing and controlling new robotics and bionics hardware.

Professional Experience

The University of Auckland — *Auckland, New Zealand*

Associate Professor — *February 2023 - Today*

Department of Mechanical and Mechatronics Engineering

The University of Auckland — *Auckland, New Zealand*

Senior Lecturer (Above the Bar) — *February 2022 - January 2023*

Department of Mechanical and Mechatronics Engineering

The University of Auckland — *Auckland, New Zealand*

Senior Lecturer — *February 2020 - Today*

Department of Mechanical Engineering

The University of Auckland — *Auckland, New Zealand*

Lecturer — *January 2017 - January 2020*

Department of Mechanical Engineering

Yale University — *New Haven, USA*

Postdoctoral Associate — *August 2014 - December 2016*

GRAB Lab, Department of Mechanical Engineering and Materials Science

National Technical University of Athens — *Athens, Greece*

Research Associate — *July 2009 - July 2014*

Control Systems Lab, School of Mechanical Engineering

Education

National Technical University of Athens — *Athens, Greece*

PhD in Mechanical Engineering — *July 2014*

School of Mechanical Engineering
Dissertation Title: “EMG Based Interfaces for Human Robot Interaction in Structured and Dynamic Environments”

National Kapodistrian University of Athens — *Athens, Greece*

MSc in Information Technologies in Medicine and Biology — *September 2010*

Department of Informatics and Telecommunications
MSc Thesis Title: “Biosignal Analysis for Human Hand Force Reconstruction and Synergies Investigation”

University of Patras — *Patras, Greece*

Diploma in Computer Engineering — *September 2008*

Computer Engineering & Informatics Department
Diploma Thesis Title: “Risk Management for e-Business: Methodologies and Tools”

Honors & Awards

2022	**Outstanding Reviewer Award (4 reviewers were selected among 5,854 reviewers)**, IEEE International Conference on Robotics and Automation (ICRA)	*Philadelphia, USA*
2022	**2nd Place, Manufacturing Track**, IEEE/RSJ IROS, Robotic Grasping and Manipulation Competition	*Online*
2022	**3rd Place, Manufacturing Track**, IEEE International Conference on Robotics and Automation (ICRA)	*Online*
2021	**Winner, Best Paper Award on Robotic Mechanisms and Design**, IEEE/RSJ IROS	*Las Vegas, USA*
2021	**Winner, Best Paper Award on Robotic Mechanisms and Design**, IEEE/RSJ IROS	*Las Vegas, USA*
2020	**Top Teacher Award 2020**, Student's Choice, Faculty of Engineering, The University of Auckland	*Auckland, NZ*
2020	**3rd Place, Manufacturing Track**, IEEE/RSJ IROS, Robotic Grasping and Manipulation Competition	*Online*
2020	**1st Prize, United Cerebral Palsy Los Angeles Assistive Devices Challenge**, Hackaday Prize	*Online*
2020	**Finalist, Best Paper Award on Robotic Mechanisms and Design**, IEEE/RSJ IROS	*Las Vegas, USA*
2019	**1st Place, Manufacturing Track**, IEEE/RSJ IROS, Robotic Grasping and Manipulation Competition	*Macau, China*
2018	**Top Teacher Award 2018**, Student's Choice, Faculty of Engineering, The University of Auckland	*Auckland, NZ*
2015	**2nd Prize (out of 900+ projects from 50+ countries)**, Hackaday Prize	*San Francisco, USA*
2015	**1st Place**, Robotdalen International Innovation Award	*Västerås, Sweden*
2014	**PhD Thesis Award**, NTUA Sarafis Award for PhD Thesis	*Athens, Greece*
2013	**Publication Award**, Thomaidion Award for Scientific Publications	*Athens, Greece*
2012	**Publication Award**, Thomaidion Award for Scientific Publications	*Athens, Greece*
2011	**Publication Award**, Thomaidion Award for Scientific Publications	*Athens, Greece*
2010	**Publication Award**, Thomaidion Award for Scientific Publications	*Athens, Greece*

Publications

Journal Articles

[149] J. Bimbo, M. Liarokapis, M. Malvezzi, and G. Salvietti, "Robotic grasping and manipulation of deformable objects," *Frontiers in Robotics and AI*, vol. 9, p. 362, 2023.

[148] J. Buzzatto and M. Liarokapis, "The omnirotor platform: A versatile, multi-modal, coaxial, all-terrain vehicle," *IEEE Access*, vol. 11, pp. 27 928–27 941, 2023.

[147] R. V. Godoy, B. Guan, F. Sanches, A. Dwivedi, and M. Liarokapis, "Electromyography based gesture decoding employing few-shot learning, transfer learning, and training from scratch," *IEEE Access*, 2023.

[146] V. Kostakis, A. Pazaitis, and M. Liarokapis, "Beyond high-tech versus low-tech: A tentative framework for sustainable urban data governance," *Big Data & Society*, vol. 10, no. 1, p. 20 539 517 231 180 583, 2023.

[145] M. Shahmohammadi, B. Guan, R. V. Godoy, A. Dwivedi, P. Nielsen, and M. Liarokapis, "On light-myography based muscle-machine interfaces for the efficient decoding of human gestures and forces," *Scientific Reports*, vol. 13, no. 1, p. 327, 2023.

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[143] J. Buzzatto and M. Liarokapis, "A benchmarking platform and a control allocation method for improving the efficiency of coaxial rotor systems," *IEEE Robotics and Automation Letters*, vol. 7, no. 2, pp. 5302–5309, 2022.

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[140] R. V. Godoy, A. Dwivedi, and M. Liarokapis, "Electromyography based decoding of dexterous, in-hand manipulation motions with temporal multichannel vision transformers," *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, vol. 30, pp. 2207–2216, 2022.

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[137] V. V. Patel, M. V. Liarokapis, and A. M. Dollar, "Open robot hardware: Progress, benefits, challenges, and best practices," *IEEE Robotics & Automation Magazine*, 2022.
[136] N. Elangovan, L. Gerez, G. Gao, and M. Liarokapis, "Improving robotic manipulation without sacrificing grasping efficiency: A multi-modal, adaptive gripper with reconfigurable finger bases," *IEEE Access*, 2021.
[135] G. Gao, C.-M. Chang, L. Gerez, and M. Liarokapis, "A pneumatically driven, disposable, soft robotic gripper equipped with multi-stage, retractable, telescopic fingers," *IEEE Transactions on Medical Robotics and Bionics*, 2021.
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[132] G. Gorjup, L. Gerez, and M. Liarokapis, "Leveraging human perception in robot grasping and manipulation through crowdsourcing and gamification," *Frontiers in Robotics and AI*, vol. 8, 2021.
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[121] M. Liarokapis and A. M. Dollar, "Combining analytical modeling and learning to simplify dexterous manipulation with adaptive robot hands," *IEEE Transactions on Automation Science and Engineering*, 2019.
[120] V. Kostakis, K. Latoufis, M. Liarokapis, and M. Bauwens, "The convergence of digital commons with local manufacturing from a degrowth perspective: Two illustrative cases," *Journal of Cleaner Production*, vol. 197, pp. 1684–1693, 2018.
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Book Chapters

[114] P. Beckerle, S. Willwacher, M. Liarokapis, M. P. Bowers, and M. B. Popovic, "Prosthetic limbs," in *Biomechatronics*, Academic Press, 2019, p. 235.

[113] M. Liarokapis, K. A. Lamkin-Kennard, and M. B. Popovic, "Biomechatronics: A new dawn," in *Biomechatronics*, Elsevier, 2019.

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Conference Papers

[109] B. Busby, G. Gao, and M. Liarokapis, "An adaptive, lightweight, body-powered system for prosthetic hands equipped with a selectively lockable differential mechanism," in *45th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, 2023.

[108] J. Buzzatto, J. Liang, M. Shahmohammadi, S. Matsunaga, R. Haraguchi, T. Mariyama, B. A. MacDonald, and M. Liarokapis, "A soft, multi-layer, kirigami inspired robotic gripper with a compact, compression-based actuation system," in *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, 2023, pp. 4488–4495.

[107] N. Elangovan, R. V. Godoy, F. Sanches, K. Wang, T. White, P. Jarvis, and M. Liarokapis, "On human grasping and manipulation in kitchens: Automated annotation, insights, and metrics for effective data collection," in *IEEE International Conference on Robotics and Automation*, 2023.

[106] G. Gao, A. Dwivedi, and M. Liarokapis, "The new dexterity adaptive humanlike robot hand: Employing a reconfigurable palm for robust grasping and dexterous manipulation," in *IEEE International Conference on Robotics and Automation*, 2023.

[105] R. V. Godoy, B. Guan, A. Dwivedi, and M. Liarokapis, "An affordances and electromyography based telemanipulation framework for control of robotic arm-hand systems," in *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, 2023, pp. 6998–7004.

[104] R. V. Godoy, B. Guan, A. Dwivedi, M. Shahmohammadi, M. Owen, and M. Liarokapis, "Multi-grasp classification for the control of robot hands employing transformers and lightmyography signals," in *45th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, 2023.

[103] B. Guan, R. V. Godoy, F. Sanches, A. Dwivedi, Y. Kwon, and M. Liarokapis, "Electromyography and potential fields based shared control framework for robotic telemanipulation," in *IEEE International Conference on Robotics and Automation*, 2023.

[102] B. Guan, R. V. Godoy, F. Sanches, A. Dwivedi, and M. Liarokapis, "On semi-autonomous robotic telemanipulation employing electromyography based motion decoding and potential fields," in *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, 2023, pp. 6991–6997.

[101] J. Liang, J. Buzzatto, B. Busby, R. V. Godoy, S. Matsunaga, R. Haraguchi, T. Mariyama, B. A. MacDonald, and M. Liarokapis, "Employing multi-layer, sensorised kirigami grippers for single-grasp based identification of objects and force exertion estimation," in *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, 2023, pp. 6433–6440.

[100] J. Liang, J. Buzzatto, and M. Liarokapis, "A tailsitter uav based on bioinspired, tendon-driven, shape-morphing wings with aerofoil-shaped artificial feathers," in *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, 2023, pp. 4750–4756.

[99] F. Sanches, G. Gao, N. Elangovan, R. V. Godoy, J. Chapman, K. Wang, P. Jarvis, and M. Liarokapis, "Scalable. intuitive human to robot skill transfer with wearable human machine interfaces: On complex, dexterous tasks," in *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, 2023, pp. 6318–6325.

[98] M. Shahmohammadi, B. Guan, R. V. Godoy, and M. Liarokapis, "An adaptive, humanlike prosthetic hand equipped with a series elastic differential and a lightmyography based control interface," in *45th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, 2023.

[97] D. Valencia, J. Jia, R. Li, A. Hayashi, M. Lecchi, R. Terezakis, T. Gee, M. Liarokapis, B. A. MacDonald, and H. Williams, "Comparison of model-based and model-free reinforcement learning for real-world dexterous robotic manipulation tasks," in *IEEE International Conference on Robotics and Automation*, 2023.

[96] J. Buzzatto, J. Chapman, M. Shahmohammadi, F. Sanches, M. Nejati, S. Matsunaga, R. Haraguchi, T. Mariyama, B. MacDonald, and M. Liarokapis, "On robotic manipulation of flexible flat cables: Employ-

ing a multi-modal gripper with dexterous tips, active nails, and a reconfigurable suction cup module," in *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2022.

[95] J. Buzzatto, M. Shahmohammadi, J. Liang, F. Sanches, S. Matsunaga, R. Haraguchi, T. Mariyama, B. MacDonald, and M. Liarokapis, "Soft, multi-layer, disposable, kirigami based robotic grippers: On handling of delicate, contaminated, and everyday objects," in *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2022.

[94] C.-M. Chang, J. Chapman, K. Wang, P. Jarvis, and M. Liarokapis, "On wearable, lightweight, low-cost human machine interfaces for the intuitive collection of robot grasping and manipulation data," in *IEEE International Conference on Robotics and Automation*, 2022.

[93] C.-M. Chang, F. Sanches, G. Gao, S. Johnson, and M. Liarokapis, "An adaptive, affordable, humanlike arm hand system for deaf and deafblind communication with the american sign language," in *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2022.

[92] J. Chapman, A. Dwivedi, and M. Liarokapis, "A dexterous, adaptive, affordable, humanlike robot hand: Towards prostheses with dexterous manipulation capabilities," in *IEEE International Conference on Humanoid Robots*, 2022.

[91] N. Elangovan, C.-M. Chang, R. V. Godoy, F. Sanches, K. Wang, P. Jarvis, and M. Liarokapis, "Comparing human and robot performance in the execution of kitchen tasks: Evaluating grasping and dexterous manipulation skills," in *IEEE International Conference on Humanoid Robots*, 2022.

[90] G. Gao, J. Liang, and M. Liarokapis, "Mechanically programmable jamming based on articulated mesh structures for variable stiffness robots," in *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2022.

[89] L. Gerez, G. Gorjup, Y. Zhou, and M. Liarokapis, "A hybrid, soft robotic exoskeleton glove with inflatable, telescopic structures and a shared control operation scheme," in *IEEE International Conference on Robotics and Automation*, 2022.

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[79] A. Dwivedi, D. Shieff, A. Turner, G. Gorjup, Y. Kwon, and M. Liarokapis, "A shared control framework for robotic telemanipulation combining electromyography based motion estimation and compliance control," in *IEEE International Conference on Robotics and Automation*, 2021.

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[72] M. Liarokapis and G. P. Kontoudis, "Teaching robotic and biomechatronic concepts with a gripper design project and a grasping and manipulation competition," in *IEEE International Conference on Robotics and Automation*, 2021.

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[70] C. Probine, G. Gorjup, J. Buzzatto, and M. Liarokapis, "A shared control teleoperation framework for robotic airships: Combining intuitive interfaces and an autonomous landing system," in *IEEE International Conference on Systems, Man, and Cybernetics*, 2021.

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[52] J. Meng, L. Gerez, J. Chapman, and M. Liarokapis, "A tendon-driven, preloaded, pneumatically actuated, soft robotic gripper with a telescopic palm," in *IEEE International Conference on Soft Robotics*, 2020.

[51] T. Bewley and M. Liarokapis, "On the combination of gamification and crowd computation in industrial automation and robotics applications," in *IEEE International Conference on Robotics and Automation*, 2019.

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[42] G. P. Kontoudis, M. Liarokapis, and K. G. Vamvoudakis, "A compliant, underactuated finger for anthropomorphic hands," in *IEEE International Conference on Rehabilitation Robotics (ICORR)*, 2019.

[41] G. P. Kontoudis, M. Liarokapis, and K. G. Vamvoudakis, "An adaptive, humanlike robot hand with selective interdigitation: Towards robust grasping and dexterous, in-hand manipulation," in *IEEE-RAS International Conference on Humanoid Robots*, 2019.

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[21] A. G. Zisimatos, M. V. Liarokapis, C. I. Mavrogiannis, and K. J. Kyriakopoulos, "Open-source, affordable, modular, light-weight, underactuated robot hands," in *IEEE/RSJ International Conference on Intelligent Robots and Systems*, IEEE, 2014, pp. 3207–3212.

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in *IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, IEEE, 2012, pp. 1287–1292.

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[13] P. K. Artemiadis, P. T. Katsiaris, M. V. Liarokapis, and K. J. Kyriakopoulos, "On the effect of human arm manipulability in 3d force tasks: Towards force-controlled exoskeletons," in *IEEE International Conference on and Automation (ICRA)*, IEEE, 2011, pp. 3784–3789.

[12] P. K. Artemiadis, P. T. Katsiaris, M. V. Liarokapis, and K. J. Kyriakopoulos, "Human arm impedance: Characterization and modeling in 3d space," in *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, 2010, pp. 3103–3108.

Patents

[11] L. Gerez and M. Liarokapis, *An underactuated soft robotic grasping device*, PCT/NZ2020/050073, 2021.

[10] M. Liarokapis, *Grasping apparatus and a vehicle including a grasping apparatus*, US Patent App. 16/954,163, 2021.

[9] C. Tassakos, M. Liarokapis, and A. Demopoulos, *Tendon slider for use in a robotic hand or other tendon-controlled system*, DE102020123892A1, 2021.

Conference Posters and Abstracts

[8] F. D. Pace, G. Gorjup, H. Bai, A. Sanna, M. Liarokapis, and M. Billinghurst, "Assessing the suitability and effectiveness of mixed reality interfaces for accurate robot teleoperation," in *26th ACM Symposium on Virtual Reality Software and Technology*, 2020, pp. 1–3.

[7] M. V. Liarokapis, A. G. Zisimatos, C. I. Mavrogiannis, and K. J. Kyriakopoulos, "Openbionics: An open-source initiative for the creation of affordable, modular, light-weight, underactuated robot hands and prosthetic devices," in *2nd ASU Rehabilitation Robotics Workshop*, 2014.

[6] M. Bianchi and M. V. Liarokapis, "Handcorpus, a new open-access repository for sharing experimental data and results on human and artificial hands," in *IEEE World Haptics Conference (WHC)*, 2013.

Technical Reports

[5] G. P. Kontoudis, M. V. Liarokapis, A. G. Zisimatos, C. I. Mavrogiannis, and K. J. Kyriakopoulos, "How to create affordable, anthropomorphic, personalized, light-weight prosthetic hands," Control Systems Lab, National Technical University of Athens, Tech. Rep., 2015.

[4] A. G. Zisimatos, M. V. Liarokapis, C. I. Mavrogiannis, G. P. Kontoudis, and K. J. Kyriakopoulos, "How to create affordable, modular, light-weight, underactuated, compliant robot hands," Control Systems Lab, National Technical University of Athens, Tech. Rep., 2014.

[3] M. V. Liarokapis, P. K. Artemiadis, C. P. Bechlioulis, and K. J. Kyriakopoulos, "Directions, methods and metrics for mapping human to robot motion with functional anthropomorphism: A review," Control Systems Lab, National Technical University of Athens, Tech. Rep., 2013.

Theses

[2] M. V. Liarokapis, "EMG based interfaces for human robot interaction in structured and dynamic environments," Ph.D. dissertation, National Technical University of Athens, 2014.

Research Funding

My research has been funded by:

- European, Japanese, and US industry partners through R&D contracts
- New Zealand companies through Part 4 Project sponsorships and R&D contracts
- Callaghan Innovation
- New Zealand Ministry of Business, Innovation and Employment (MBIE)
- The University of Auckland - Faculty Research Development Funding
- IEEE Robotics and Automation Society - Special Interest Group on Humanitarian Technology (RAS-SIGHT)
- The University of Auckland - Centre for Automation and Robotic Engineering Science

In total, I have generated grants totalling >$2,300,000 (NZD) as principal investigator (PI) and I have participated in grants totalling >$1,275,000 (NZD) as an associate investigator (AI).

Service Activities

Associate Editor, International Journals

International Journal of Robotics Research
IEEE Robotics and Automation Letters
IEEE/ASME Transactions on Mechatronics
Frontiers in Robotics and AI

Associate Editor, International Conferences

IEEE International Conference on Robotics and Automation (ICRA) (2018-2024)
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) (2018-2024)
IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (2018, 2020, and 2024)

Organisation of International Conferences

I have served as Local Chair for the 2022 Conference on Robot Learning (CoRL)
I have served as Online Experience Chair and Workshops/Tutorials Chair for the 2023 IEEE International Conference on Automation Science and Engineering (CASE)

Chair/Co-Chair, International Conferences

I have served as Chair/Co-Chair for the following sessions of international robotics and mechatronics conferences:

- Chair of “Mechanism Design II”, 1 Jun 2021, IEEE International Conference on Robotics and Automation
- Co-Chair of “Robotic Systems II”, 13 Oct 2020, IEEE International Conference on Systems, Man, and Cybernetics
- Chair of “Virtual and Augmented Reality Systems”, 14 Oct 2020, IEEE International Conference on Systems, Man, and Cybernetics
- Co-Chair of “Perception for Grasping and Manipulation I” session, 28 Oct 2020, IEEE/RSJ International Conference on Intelligent Robots and Systems
- Chair of “Assembly and Picking” session, 8 Oct 2020, IEEE/RSJ International Conference on Intelligent Robots and Systems
- Chair of “Telerobotics and Teleoperation II” session, 6 Nov 2019, IEEE/RSJ International Conference on Intelligent Robots and Systems
- Co-Chair of “Rehabilitation Robotics II” session, 7 Nov 2019, IEEE/RSJ International Conference on Intelligent Robots and Systems
- Co-Chair of “Wearable Robotic Systems - Orthotics”, 27 July 2019, 41st Annual International Conference of the IEEE Engineering in Medicine & Biology Society
- Co-Chair of “Wearable Robotic Systems - Prosthetics”, 27 July 2019, 41st Annual International Conference of the IEEE Engineering in Medicine & Biology Society
- Chair of “Artificial Intelligence and Machine Learning”, 10 July 2018, IEEEASME International Conference on Advanced Intelligent Mechatronics
- Co-Chair of “New Frontiers in Biomechatronics: From Brain Machine Interfaces to Assistive and Rehabilitation Robotics”, 9 July 2018, IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM)

- Chair of “Grasping I” session, 25 Sep 2017, IEEE/RSJ International Conference on Intelligent Robots and Systems
- Chair of “Grasping II” session, 25 Sep 2017, IEEE/RSJ International Conference on Intelligent Robots and Systems
- Chair of “Manipulation” session, 30 July 2015, International Conference on Advanced Robotics

Reviewer, Research Funding Agencies

National Science Foundation (NSF), United States
Natural Sciences and Engineering Research Council, Canada

Reviewer, International Journals

Sage Journals, The International Journal of Robotics Research
IEEE, Transactions on Robotics
IEEE, Robotics and Automation Magazine
IEEE, Robotics and Automation Letters
IEEE, Transactions on Mechatronics
IEEE, Transactions on Cybernetics
IEEE, Transactions on Biomedical Engineering
IEEE, Transactions on Industrial Electronics
IEEE, Transactions on Automation Science and Engineering
IEEE, Transactions on Neural Systems and Rehabilitation Engineering
IEEE, Transactions on Systems, Man and Cybernetics: Systems
IEEE, Journal of Biomedical and Health Informatics
IEEE, Access
Springer, Journal of Intelligent and Robotic Systems
Springer, Cognitive Computation
Cambridge University Press, Robotica
ASME, Journal of Dynamic Systems, Measurement, and Control
ASME, Journal of Mechanisms and Robotics
Frontiers in, Bioengineering and Biotechnology
Frontiers in, NeuroRobotics
Elsevier, Robotics and Computer Integrated Manufacturing
Elsevier, The Surgeon

Reviewer, International Conferences

IEEE International Conference on Robotics and Automation (ICRA)
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR)
IEEE International Conference on Systems, Man, and Cybernetics (SMC)
IEEE International Symposium on Robot and Human Interactive Communication (Ro-Man)
IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob)
IEEE-RAS International Conference on Humanoid Robots (Humanoids)
IEEE International Conference on Rehabilitation Robotics (ICORR)
IEEE International Conference on Advanced Robotics and Mechatronics (ICARM)
IEEE Mediterranean Conference on Control & Automation (MED)
IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)
IEEE Workshop on Signal Processing Systems (SIPS)
IEEE World Haptics
IEEE International Conference on Advanced Robotics (ICAR)
Robotics Science and Systems

Teaching Experience

The University of Auckland

Auckland, New Zealand

Department of Mechanical Engineering

MECHENG 736: Biomechatronic Systems (2017-Today)
Role: Course Director - Course Coordinator - Lecturer
Description: Explores mechatronic principles and techniques for measuring and manipulating biological systems. Learning objectives include human biomechanics and motion control, advanced serial and parallel robots, compliant soft robots, software and functional safety, human robot interaction and force control, novel sensors and actuators, and biomechatronics design principles.

MECHENG 201: Introduction to Mechatronics (2018-Today)
Role: Course Director - Lecturer
Description: Introduces mechatronics to mechanical and mechatronics engineers. Covers sensors and actuators, analogue and digital circuit elements for signal processing and programming.

MECHENG 700 A/B: Part IV (Final Year) Research Project (2019-Today)
Role: Course Coordinator
Description: The Part IV Research Project provides an opportunity for students to work largely on their own initiative (but under constant supervision), on a topic of interest for Mechanical and Mechatronics Engineers. The research project counts as two courses (a total of 30 points), one in each semester. Work takes place over a complete academic year, requiring you to enroll in both MECHENG 700A and 700B courses (for both Mechanical and Mechatronics students). Although you will be working in groups of two under the direction and continuing guidance of a project supervisor, the research project requires independent thought and action. We hope that you will feel a personal sense of achievement by the end of the academic year. The project can also be seen within a professional context where you, as an engineer, have to investigate a particular problem in some depth and produce both an analysis of the problem and its solution. The basis of the solution must include a formal report, a conference presentation and an industrial display. Some projects focus primarily on laboratory work and can involve substantial liaison with local industry, while others may be more analytical or computational. It must be noted that individual grades are awarded for this research project.

MECHENG 201: Electronics and Computing for Mechanical Engineers (2017)
Role: Lecturer
Description: Mechanical engineers need to be familiar with those electronics and software elements that are now vital components of most mechanical products and processes. Introduces sensors and actuators, analogue and digital circuit elements for signal processing, and computing and software programming.

National Technical University of Athens

Athens, Greece

School of Mechanical Engineering

July 2009 – July 2014

Teaching assistant for undergraduate level courses on: Robotics, Micro-Controllers and Digital Control, Industrial Electronics and Control Systems.

Student Supervision

The University of Auckland (Main Supervisor)

Alumni - PhD Students

Dr. Lucas Gerez (2021)
Current Position: Postdoctoral Fellow, Harvard University (USA)

Dr. Anany Dwivedi (2021)
Current Position: Postdoctoral Associate, FAU Erlangen-Nürnberg / TU Darmstadt (Germany)

Dr. Gal Gorjup (2021)
Current Position: Robotics Development Engineer, Airnamics (Slovenia)

Current PhD Students

Geng Gao, PhD Candidate (2018 – Today)
Nathan Elangovan, PhD Candidate (2017 – Today)
Yongje Kwon, PhD Candidate (2017 – Today)
Che-Ming Chang, PhD Candidate (2018 – Today)
Mojtaba Shahmohammadi, PhD Candidate (2018 – Today)
Jayden Chapman, PhD Candidate (2019 – Today)
Joao Buzzato, PhD Candidate (2019 – Today)
Felipe Sanches, PhD Candidate (2021 – Today)
Ricardo de Godoy, PhD Candidate (2021 – Today)
Shaoqian Lin, PhD Candidate (2021 – Today)

Alumni - ME Students - Research Theses

Jimmy Lin, 2021
Vandna Patel, 2021
Navin Perera, 2021
Arran Davis, 2020
Helen Evans, 2019
Varatharajan Srinivasan, 2019

Current ME Students

Alex Hayashi
Dah Young Kim
Devin Mukalanyaye Ranasinghe

Alumni - MEngSt Students - Research Projects

Yuran Zhou, 2021
Nigel Sim Joon Leck, 2020
Kyaw Tun Ko, 2020
Rohit Joshua Rajasekar, 2020
Waris Hasan, 2019 - Outcomes: 1 conference paper (IEEE IROS) and 1 journal paper (IEEE RA-L)
Harsha Thiruvengadam, 2019
Junan Chen, 2018 - Outcome: 1 journal paper (IEEE RA-L)
Alexandre Eichene, 2018
Ashkan Eslamighane, 2018
Sai Sasanka Jupalli, 2018
Chi-Hung Yang, 2018 - Outcome: 1 journal paper (IEEE RA-L)
Shivang Pathak, 2017
Brahmaji Alla Rudhra, 2017
Pratik Sankh, 2017

Alumni - Undergraduate Students – Part 4 Project Groups

2020
Dasha Shieff & Amber Turner
Outcomes: 2 Conference Papers (IEEE EMBC & IEEE ICRA)

Lucy Johnston & Leon Thambiran
Outcome: IEEE/RSJ IROS, Robotic Grasping and Manipulation Competition, 3rd Place in Manufacturing Track

Alexander Ruddell & Rochester Zhang
Outcome: Mechanical Engineering Group (MEG) Part 4 Project Award

Zane Imran & Adam Scott
Outcome: Crown Robotics Technology Centre Part 4 Project Award

Chester Jerrat & Bradley Sauvarin

2019
Lydia Hingston & Jonathan Mace
Outcomes: Mechanical Engineering Group (MEG) Part 4 Project Award and 1 conference paper (IEEE SSRR)

Bryan Busby & Tzer Xi Lim
Charlie Chen & Jimmy Lin
Amaasha de Alwis & Seo In Park
Charlie Hu & Alice Xiao
Keshav Krishna & Geetanjali Lamba

2018
Yige Cao & Lucy Young,
Outcome: Beckhoff Automation Limited, Part 4 Project Award

Luke Cen & Varun Karkera
Outcome: Caliber Design Part 4 Project Award

Laurence de Burgh & Jonathan Willis
Evan Maunder & Brandon Samountry
Karl Pereira & Mark Pochivalov

2017
Andrew McLaren & Zachary Fitzgerald
Outcome: EDNZ, Part 4 Project Award

Peter Gasparini & Geng Gao
Outcome: Crown Robotics Technology Centre, Part 4 Project Award

Bruno Johnston & Zak Flintoff
Outcomes: Mechatronics Staff Part 4 Project Award and 1 conference paper (IEEE IROS)

Jared Lean & Nisal Manamperi
Regan Cornelius & Eythan Prendergast

Current Undergraduate Students – Part 4 Project Groups

Gus Barrowman & Nathan Varney
Jack Breen & Finn McDonnell
Bonnie Guan & Joshua Frankson
Russell Feng & Zach Macleod
Peter Mitchell & Reuben O'Brien
Anushka Siriwardane & Sabrina Teoh

Yale University (Co-Supervision with Prof. Aaron Dollar)

Bryan Duerfeldt, Undergraduate Student (June 2015 – May 2016)
Dept. of Mechanical Engineering and Materials Science

National Technical University of Athens (Co-Supervision with Prof. Kostas Kyriakopoulos)

George Kontoudis, Undergraduate Student (February 2014 – April 2016)
Control Systems Lab - School of Mechanical Engineering
Outcomes: 2nd Place - 2015 Hackaday Prize, 1st Place - Robotdalen Innovation Award, 1 conference paper (IEEE IROS)

Agisilaos Zisimatos, Undergraduate Student (May 2013 – September 2015)
Control Systems Lab - School of Electrical and Computer Engineering Outcomes: 2 conference papers (IEEE IROS)

George Boutselis, Undergraduate Student (March 2012 – February 2014)
Control Systems Lab - School of Mechanical Engineering
Outcomes: 2 conference papers (IEEE ICRA & IEEE IROS) and 1 book chapter

Christoforos Mavrogiannis, Undergraduate Student (March 2011 – September 2013)
Control Systems Lab - School of Mechanical Engineering
Outcome: 1 conference paper (IEEE IROS)

Talks

Invited Talks

[31] "Transforming Construction of High-Quality, Affordable Houses Employing a New Class of Intelligent Collaborative Robots", ConCOVE Stakeholder Event, July 29, 2021, Wellington (New Zealand).

[30] "Innovation in Robotics and Bionics: Making Humans and Robots More Dexterous", Auckland ITx Innovation Day, July 23, 2021, Auckland (New Zealand).

[29] "Innovation in Robotics and Bionics: Making Humans and Robots More Dexterous", Waikato/BoP ITx Innovation Day, July 21, 2021, Hamilton (New Zealand).

[28] "Innovation in Robotics and Bionics: Making Humans and Robots More Dexterous", Techweek2021 'Building compliance goes digital', Standards New Zealand, May 24, 2021, Wellington (New Zealand).

[27] "A Hybrid, Soft, Assistive Exoskeleton Glove for the Execution of Activities of Daily Living", AIBotics 2020 - "Communities and Digital Care" Session, November 5, 2020, Online.

[26] "Increasing the Dexterity of Humans and Robots: From Robust Grasping and Dexterous Manipulation to Haptic Object Identification", RO-MAN 2020 Worskshop on Social Human-Robot Interaction of Human-Care Service Robots, September 2, 2020, Naples (Italy) / Online.

[25] "Increasing the Dexterity of Humans and Robots: From Robust Grasping and Dexterous Manipulation to Haptic Object Identification", ITMB Invited Talk, Biomedical Research Foundation of the Academy of Athens, December 19, 2019, Athens (Greece).

[24] "Equipping Robots with Dexterous Manipulation Capabilities", Creative Technologies Network, University of Auckland, June 5, 2019, Auckland (New Zealand).

[23] "Equipping Robots with Dexterous Manipulation Capabilities", ITMB Invited Talk, Biomedical Research Foundation of the Academy of Athens, November 21, 2018, Athens (Greece).

[22] "A New Class of Adaptive Hands: Towards Humanlike Robot Dexterity", IEEE AIM 2018 - Workshop on "New Frontiers in Biomechatronics: From Brain Machine Interfaces to Assistive and Rehabilitation Robotics", July 9, 2018, Auckland (New Zealand).

[21] "A New Class of Adaptive Hands: Towards Humanlike Robot Dexterity", IRTG Summer School on Soft Tissue Robotics, July 4, 2018, Stuttgart (Germany).

[20] "A New Class of Adaptive Hands: Towards Humanlike Robot Dexterity", Auckland Bioengineering Institute, April 17, 2018, Auckland (New Zealand).

[19] "A New Class of Adaptive Hands: Towards Humanlike Robot Dexterity", 10th International Schunk Expert Days, March 1, 2018, Lauffen (Germany).

[18] "A New Class of Adaptive Hands: Towards Humanlike Robot Dexterity", ITMB Invited Talk, Biomedical Research Foundation of the Academy of Athens, December 22, 2017, Athens (Greece).

[17] "Adaptive Robot Hands: Designs, Theory, Challenges, Applications", IEEE IROS 2017 - Workshop on "Agile Robotics for Industrial Automation Competition (ARIAC)", September 24, 2017, Vancouver (Canada).

[16] "Open Innovation & Robot Evolution", Athens Science Festival, April 2, 2017, Athens (Greece).

[15] "OpenBionics: Open-Source, Affordable Prosthetic Hands", Workshop on "Open Innovation and Industrial Property" organized by the Hellenic Industrial Property Organisation - Impact Hub Athens, December 17, 2016, Athens (Greece).

[14] "Simplifying Grasping, Dexterous, In-Hand Manipulation and Object Identification with Adaptive Hands", Department of Mechanical Engineering, Virginia Tech, November 15, 2016, Blacksburg (USA).

[13] "Adaptive Robot Hands: Designs, Theory, Challenges, Applications", Department of Mechanical Engineering, University of Auckland, August 9, 2016, Auckland (New Zealand).

[12] "Adaptive Robot Hands: Designs, Theory, Challenges, Applications", Edinburgh Centre for Robotics, University of Edinburgh, May 19, 2016, Edinburgh (UK).

[11] "Open Robot Hardware: Designs, Challenges and Applications", Robotics Track Panel – 2016 IEEE Region 1 Student Conference, April 16, 2016, New Britain (USA).

[10] "Single Grasp Object Classification with Adaptive Hands and Tactile Sensing", Human and Robot Hands, Human and Robot Touch: Sensorimotor Synergies to Bridge the Gap Between Neuroscience and Robotics workshop of the 2016 Haptics Symposium, April 8, 2016, Philadelphia (USA).

[9] "Open Bionics: Open Innovation", PANORAMA of Entrepreneurship and Career, April 3, 2016, Athens (Greece).

[8] "OpenBionics: Designing our Bionic Future", TEDx Thessaloniki, April 2, 2016, Thessaloniki (Greece).

[7] "Adaptive Robot Hands: Designs, Challenges and Applications", Department of Mechanical Engineering, University of Melbourne, February 24, 2016, Melbourne (Australia).

[6] "Open Robot Hardware: Designs, Challenges and Applications", IEEE Connecticut Robotics Speaker Series, February 17, 2016, New Britain, CT (USA).

[5] "OpenBionics: Revolutionizing Prosthetics with Open-Source Dissemination", Hackaday Superconference, November 14, 2015, San Francisco, CA (USA).

[4] "Adaptive Robot Hands: Challenges and Applications", Cornell Robotics Seminar, November 6, 2015, Ithaca, NY (USA).

[3] "EMG Based Interfaces for Human Robot Interaction", Human-Oriented Robotics and Control Lab, Arizona State University, February 27, 2014, Tempe, AZ (USA).

[2] "Brain Machine Interfaces for Human Robot Interaction with Functional Anthropomorphism", Board of European Students of Technology (BEST), October 30, 2013, Athens (Greece).

[1] "Investigation of Human Arm-Hand System Motor Synergies Adaptation in Microgravity Environment", February 7-8, 2011, European Space Agency (ESA), European Space Research and Technology Centre (ESTEC), Noordwijk (Netherlands).

Initiatives

Robotics NZ *www.robotics.ac.nz*

Founder *June 2020 - Today*

- Robotics.ac.nz is an initiative dedicated to the community of New Zealand / Aotearoa researchers, academics, technologists, enthusiasts, and industry representatives that work in the field of Robotics and Automation.

Robotics and Bionics Commons *www.roboticscommonts.org* *www.bionicscommons.org*

Founder *June 2020 - Today*

- Robotics Commons and Bionics Commons are two online repositories focusing on open-source software and open hardware robotics and bionics projects. Currently, these two repositories host all the open-source robotics and bionics projects of the New Dexterity research group.

OpenBionics *www.openbionics.org*

Research Advisor / Founder *July 2013 - Today*

- OpenBionics is an open-source initiative that focuses on the development of affordable, adaptive robotic and prosthetic devices.

OpenRobotHardware *www.openrobothardware.org*

Co-Founder / Technical Coordinator *August 2014 - Today*

- OpenRobotHardware is intended to serve as a resource for efforts focusing on open-source mechanical and electrical hardware, with a particular focus on projects that may be useful in robotics applications, robotics research and education.

HandCorpus *www.handcorpus.org*

Co-Founder / Technical Coordinator *February 2011 - Today*

- HandCorpus is a repository where everyone can freely share and search for different kinds of experimental data, about human and robotic hands. It is sponsored and supported by many important European Projects and research groups.

Press and Media Coverage

(Recent Selected Articles)

[4] ACABIM and robotics – leading the future of compliant construction, Standards New Zealand (May 2021) URL `https://www.standards.govt.nz/news-and-updates/acabim-and-robotics-leading-the-future-of-compliant-construction/`

[3] New Dexterity wins international nonprofit challenge, University of Auckland (December 2020) URL https://www.auckland.ac.nz/en/news/2020/12/16/new-dexterity-wins-international-nonprofit-challenge.html

[2] Human-Like Robots or Robot-Like Humans? New Dexterity is Bringing Us Closer, MOTAT Museum of Transport and Technology (November 2020) URL www.motat.nz/interactive/new-dexterity

[1] University of Auckland Engineers Build 3D Printed Robotic Airship for Education and Research, 3D Printing Industry (April 2020) URL https://3dprintingindustry.com/news/university-of-auckland-engineers-build-3d-printed-robotic-airsl

[1] Open Source Robotic Indoor Airship with 3D Printed Frame, 3DPrint.com (April 2020) URL https://3dprint.com/265922/ieee-researchers-develop-and-evaluate-robotic-indoor-airship-with-3d-printed-frame/

Professional Memberships

Senior Member, IEEE (Institute of Electrical and Electronics Engineers) | (2019 - Today)

Member, IEEE (Institute of Electrical and Electronics Engineers) | (2010 - 2019)

Senior Member, IEEE Robotics and Automation Society | (2019 - Today)

Member, IEEE Robotics and Automation Society | (2010 - 2019)

Member, Technical Chamber of Greece | (2008 - Today)

Professional Certificates

Stanford University *Palo Alto, CA, USA*

Advanced Project Management Certificate *2009*

Courses: Leading Effective Teams, Leadership for Strategic Execution, Converting Strategy into Action, Project Management Mastery, Mastering the Integrated Program, Project Risk Management.