

CURRICULUM VITAE

Dr. ir. Johannes T. B. (Bas) Overvelde

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Website: www.overvelde.com
www.amolf.nl/research-groups/soft-robotic-matter
www.research.tue.nl/en/persons/bas-overvelde
www.softmodbot.com
www.studioovervelde.com
www.linkedin.com/in/overvelde
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WORK EXPERIENCE

- 2020-present: Eindhoven University of Technology (NL)
Associate Professor
Dynamics and Control Group, Department of Mechanical Engineering and the Institute for Complex and Molecular Systems (ICMS)
- 2016-present: Soft Robotic Matter Group, AMOLF (NL)
Principal Investigator (Tenured)
Current Group members: Niels Commandeur (Technician), Sumit Mohanty, Shibo Zou (PostDoc), Mannus Schomaker, Alberto Comoretto, Bob Huisman, Elif Kurt, Sergio Picella, Paul Ducarme (PhD-students), Maziar Arfaee (guest PhD-student), 6 Master interns
Alumni: Florian Wruck, Udit Choudhury (PostDoc), Giorgio Oliveri, Agustin Iniguez-Rabago, Luuk van Laake (PhD-students), Jelle de Vries, Cesare Carissimo (Research Assistant), Lyndsey Housdon (Artist), 2 PhD guests, 8 Bachelor interns and 25 Master interns
- 2017-present: Studio Overvelde (NL)
Technical Consultant
- 2011-2012: Femto Engineering (NL)
Consultant, R&D and FEM engineer
- 2009-2010: Department of Industrial Design, Delft University of Technology (NL)
Warehouse and Personnel Manager

EDUCATION

- 2012-2016: School of Engineering and Applied Sciences, Harvard University (US)
PhD in Applied Mathematics
PhD dissertation: 'Embracing Compliance and Instabilities to Achieve Function in Mechanical Metamaterials and Devices'. Advisor prof. Katia Bertoldi. [\[pdf\]](#)
- 2012-2013: School of Engineering and Applied Sciences, Harvard University (US)
SM in Applied Mathematics
- 2009-2012: Delft University of Technology (NL)
MSc in Mechanical Engineering
Cum laude (GPA 4.0 - 8,7/10).
Specialization: Solid and Fluid Mechanics.
Master's thesis: 'The Moving Node Approach in Topology Optimization - An Exploration to a Flow-inspired Meshless Method-based Topology Optimization Method'. Advisors prof. dr. ir. Fred van Keulen and dr. ir. Matthijs Langelaar. [\[pdf\]](#)
Research Internship: 'The Effect of Shape on Periodic Structures Undergoing Elastic Instability', Harvard University (US).
- 2006-2009: Delft University of Technology (NL)
BSc in Mechanical Engineering
Cum laude (GPA 3.9 - 7,9/10).
Bachelor's thesis: 'Cavitation-treatment Times of a Liquid'. [\[pdf\]](#)
- 2004-2009: Delft University of Technology (NL)
P (propaedeutic exam) in Applied Physics
- 1998-2004: CSG het Noordik, Almelo (NL)
VWO (preparatory scientific education)

TEACHING

- 2021-present: TU/e (NL)
Lecturer in Device Integrated Responsive Materials Project Course 6EMA62
- 2016-present: AMOLF (NL)
Mentor of (inter)national Bachelor's (8) and Master's (25) students
Guest Lecturer in Instabilities in Soft Structures
- 2015-present: ETH Zurich (CW), Harvard University (US), WUR (NL), TU Delft (NL), and the Royal Academy of Art (NL)
Guest Lecturer in Soft Robotics and Mechanical Metamaterials
- 2014: School of Engineering and Applied Sciences, Harvard University (US)
Teaching Fellow Computational Solid and Structural Mechanics ES128
- 2013-2015: Bertoldi Group, Harvard University (US)
Mentor of (inter)national Bachelor's (1) and Master's (9) students
- 2008-2009: Department of Industrial Design, TU Delft (NL)
Lab Instructor WBTP113-07 and WBTP115 drilling, milling, turning and welding
- 2008-2009: Cultural Center Delft (NL)
Instructor weekly juggling workshops

GRANTS

- 2023: NWA-ORC, NWO (NL)
Main applicant "Holland Hybrid Heart"
- 2022: KIEM GoCI, NWO (NL)
Co-applicant "Designing Shape-Changing Textiles"
- 2022: Zwaartekracht, NWO (NL)
Co-applicant "Interactive Polymer Materials Research Center"
- 2021: ASML/ARCNL/AMOLF collaboration (NL)
Main applicant "Mechanical Metamaterials for Positioning"
- 2020: Startup package, TU/e (NL)
Personal grant to stimulate collaborations between the Soft Robotic Matter group and TU/e
- 2020: H2020-ERC Stg, European Commission (EU)
Personal grant "Smart fluidic circuits for autonomous soft robots"
- 2019: IPBooster, European Commission (EU)
Co-applicant for IP related fees Hybrid Heart consortium
- 2019: Lorentz workshop @Snellius, Lorentz Center (NL)
Co-organizer workshop "Autonomous behaviour in living and robotic matter"
- 2017: Veni Innovational Research Incentives Scheme, NWO (NL)
Personal grant "Integrating mechanical metamaterials in soft robots"
- 2017: H2020-FETOPEN, European Commission (EU)
Co-chair consortium "Hybrid Heart: Development of the first fully biocompatible, soft actuated heart"
- 2017: European cooperation project "Les Voyages de Capitaine futur" (EU),
Co-applicant to build interactive art installation "Edge of Chaos"
- 2017: KIEM Creative Industry, NWO (NL)
Co-applicant "Project Cairo: an intelligent, soft-robotic jacket"
- 2017: Internal competition to promote collaboration and hire Postdoc, AMOLF (NL)
Co-applicant "Stochastic Molecular Matter"
- 2016: Startup package, AMOLF (NL)
Personal grant to start the "Soft Robotic Matter" group
- 2014: Haythornthwaite Foundation Student Travel Award, ASME AMD (US)
- 2014: Robert L. Wallace Prize Fellowship, Harvard University (US)
- 2013: Robert L. Wallace Prize Fellowship, Harvard University (US)
- 2012: Fulbright Grant, The Fulbright Center (NL)
- 2012: University Fund Delft Grant, TU Delft (NL)

2010: Justus & Louise van Effen Excellence Scholarship, TU Delft (NL)

AWARDS

2022: Koninklijke Nederlandse Akademie van Wetenschappen Early Career Award (NL)
2022: Nominated for TU/e Science Award (NL)
2020: Engineering Talent 2020, De Ingenieur (NL)
2019: Invention Disclosure Form (with L. C. van Laake), AMOLF (NL)
2018: Nominated for New Scientists Scientific Talent award (NL)
2018: Maker of Merit Award, Makerfaire Eindhoven (NL)
2017: Runner-up Soft Robotic Toolkit online competition, Harvard University (US)
2015: 1st prize winner of the Gallery of Mechanics at New.Mech 2015, Boston University (US)
2014: Certificate of Excellence and Distinction in Teaching for the course ES128, Derek Bok Center for Teaching and Learning, Harvard University (US)
2012: UfD-Best Graduate of 3mE Faculty Grant, TU Delft (NL)
2011: Employee of the Year Award, Femto Engineering (NL)
2009: Best Research Award, BSc thesis TU Delft (NL)

PROFESSIONAL SERVICE

Member

Eindhoven Young Academy of Engineering (2022-2026)

Associate editor

Open Access journal “Programmable Materials”, Cambridge University Press (2022)

Workshop organizer

Co-organizer Lorentz workshop@Snellius (2020)

Conference session organizer and chair

Co-organizer of sessions at the APS March Meeting (2017-2020) and at SES (2018-2020)

PhD Committees

Promoter: G. Oliveri, A. Iniguez-Rabago (2021)

Member: S. Jafarzadeh (2023), Y. Zhang, D. Zrinscak, M. Essink (2022), N. Singh (2019), P. Dieleman, L. Lubbers (2018), B. Florijn (2016)

MSc Committees

M. Collaris (2022), S. Picella, J. de Vries (2021), M. Schomaker, C. Carissimo, G. Galiti (2020), A. Pasman (2019), R. Jongerius (2018), A. Sabbadini, A.A.T.M. Delissen (2016)

Ad hoc reviewer

Science, Science Robotics, Science Advances, Nature, Nature Materials, Nature Physics, Nature Communications, Nature Energy, PNAS, Matter, Soft Robotics, Soft Matter, PRL, PRX, PRE, Advanced Materials, Advanced Functional Materials, Advanced Science, Advanced Materials Technologies, EML, JAM, IEEE/ASME International Conference on Advanced Intelligent Mechatronics, SIAM Journal on Scientific Computing

Reviewer grant proposals and scholarships

EU StG, SNSF, NWO Rubicon, JKU LIT, TTW OTP, ENIAC scholarship

Professional membership

The American Society of Mechanical Engineers (ASME)

American Physical Society (APS)

Society of Engineering Science (SES)

@Harvard University (US)

Social and year-end event committee for Materials Science and Mechanical Engineering (2014-2016)

@AMOLF (NL)

Data management team (2019-2020), chair data management team (2020-present)

Organizer open day (2016-2019)

Improving AMOLF website (2016-2017)

INVITED TALKS

2023 Dutch Soft Robotics Symposium, Twente (NL)

- Invited talk:** There's no Silicon in these Silicone robots!
- 2023 IEEE Robosoft conference, Singapore (SG)
Invited talk: Harnessing Instabilities to Embody Intelligence in Soft Robots
- 2023 IEEE Robosoft conference, Singapore (SG)
Invited talk: Fluidic Sensing and Memory in Soft Robots
- 2023 Physics colloquium, Eindhoven University of Technology, Eindhoven(NL)
Invited talk: Embodied Fluidic Circuits to Control Soft Robots
- 2023 Interactive Design colloquium, Eindhoven University of Technology, Eindhoven(NL)
Invited talk: Embodying Intelligence in Soft Fluidic Robots
- 2022 Soft Matter seminar University of Amsterdam, Amsterdam (NL)
Invited talk: Continuous learning of emergent behavior in robotic matter
- 2021 NWO, online (NL)
Invited talk: Zachte Robots
- 2021 Biosystems Engineering, Wagening University & Research, online (NL)
Guest lecture: Soft robotics: pneumatic actuation
- 2021 TU/e Polymer Technology group, online (NL)
Invited talk: Embodied fluidic circuits to control soft robots
- 2021 IBEC - ICMS joint symposium, online (NL)
Invited talk: Embodied intelligence in soft robots
- 2021 Princeton University PRISM seminar series, online (US)
Invited talk: Embodied fluidic circuits to control soft robots
- 2020 BioRob Cardio workshop, online (US)
Invited talk: Embodied fluidic circuits to control soft robots
- 2020 ETCH Zurich seminar series on robotics, online (CH)
Invited talk: Embodied fluidic circuits to control soft robots
- 2020 Lunch Meeting TU/e D&C, online (NL)
Invited talk: Embodied fluidic circuits to control soft robots
- 2020 INM virtual mini-symposium, online (GE)
Invited talk: Rational design of reconfigurable and multistable metamaterials
- 2020 Robosoft, online (US)
Invited talk: Continuous learning of emergent behavior in robotic matter
- 2020 Living Machines Conference, online (GE)
Keynote talk: Adaptive behavior through decentralized learning in soft robotic matter
- 2019 Topics in IC, Utrecht (NL)
Invited talk: Soft Robots
- 2019 FlexMOF, Dresden (GE)
Invited talk: Origami-inspired Mechanical Metamaterials
- 2019 ICMS Colloquia, Eindhoven (NL)
Invited talk: Soft Robotic Matter
- 2019 General Physics Colloquium, Groningen (NL)
Invited talk: Embedded Control of Soft Robots
- 2019 ESA, Noordwijk (NL)
Invited talk: Embedded Control of Soft Robots
- 2019 livMatS, Freiburg (GE)
Invited talk: Embedding Fluid Logic and Self-learning in Soft Robotic Matter
- 2019 Royal Academy of Art, Den Haag (NL)
Guest lecture and workshop: Origami-inspired Materials and Robots
- 2019 Gordon Conference Crystal Growth and Assembly, Manchester US
Invited talk: Transforming Materials
- 2019 Hyber, Helsinki (FI)
Invited talk: Soft Robotic Matter
- 2019 ICMS Outreach Symposium, Eindhoven (NL)
Invited talk: Sequential Actuation of Soft Robots by Harnessing Soft Fluidic Networks

- 2019 Studium Generale, Groningen (NL)
Keynote talk: Origami-inspired Materials and Robots
- 2018 ASME IMECE, Pittsburgh (US)
Invited talk: Computational Design of Multistable Prismatic Architected Materials
- 2018 Fablearn, Eindhoven (NL)
Masterclass: RainMaker: from Mechanical Metamaterial to Interactive Art Installation
- 2018 The Hamlyn Symposium on Medical Robotics, London (UK)
Invited talk: Programming the Response of Fluidic Soft Actuators by Harnessing Nonlinearities
- 2018 ReMAR, Delft (NL)
Invited talk: Transforming Materials
- 2018 Equinix, Amsterdam (NL)
Keynote talk: Mathemagical interconnections
- 2018 Nationale Wiskundedagen, Noordwijkerhout (NL)
Invited talk: Van Origami-materialen naar Zachte Robots
- 2018 Physics@Veldhoven, Veldhoven (NL)
Invited talk: Rational Design of Reconfigurable Architected Materials
- 2018 Gordon Conference Multifunctional Materials and Structures, Ventura (US)
Invited talk: Finding the Mechanically Stable States in Prismatic Architected Materials
- 2017 SURFnet, Utrecht (NL)
Invited talk: Van Origami-materialen naar Zachte Robots
- 2017 Ars and Mathesis, Utrecht (NL)
Invited talk: Transforming Materials
- 2017 ARCNL, Amsterdam (NL)
Invited talk: Embracing compliance and instabilities in mechanical systems
- 2017 TEDxGroningen, Groningen (NL)
Invited talk: What can we learn from crumpling a piece of paper?
- 2017 School of Architecture, TU Delft (NL)
Guest lecture: Robotic Building - Media Studies
- 2017 AMOLF Open Dag, Amsterdam (NL)
Invited talk: Van Origami-materialen naar Zachte Robots
- 2017 HMC Zomeracademie, Rotterdam (NL)
Invited talk: Magic Materials make Soft Robots
- 2017 Soft and Biological Matter Seminar, Leiden (NL)
Invited talk: Rational Design of Reconfigurable Architected Materials
- 2017 PINC.18 Conference, Utrecht (NL)
Invited talk: Magic Materials make Soft Robots
- 2017 SMS Europe, Paris (FR)
Invited talk: Rational Design of Reconfigurable Architected Materials
- 2017 AMOLF, Amsterdam (NL)
public colloquium: Rational Design of Reconfigurable Devices and Architected Materials
- 2016: AMOLF, Amsterdam (NL)
Friday seminar: Soft Robotic Matter
- 2016: 3D Printing Materials Conference, Maastricht (NL)
Invited talk: Embracing Compliance in Robots to Achieve Function
- 2015: Designer Matter, AMOLF (NL)
Invited talk: Controlling Soft Structures and Devices by Embedded Actuation and Sensing
- 2015: Aerospace Structures and Computational Mechanics, TU Delft (NL)
Invited talk: Actuated Materials, Smart Actuated Structures and Devices that Harness Compliance and Instabilities
- 2015: Institute Lorentz, Leiden University (NL)
Soft Matter Physics Seminar: Mechanical Metamaterials that Harness Instabilities and Folding
- 2015: School of Engineering and Applied Sciences, Harvard University (US)

- 2015: **MSME Year End Event: From Origami to Transformable Metamaterials**
Graduate School of Design, Harvard University (US)
Guest Lecturer in Computational Material Distributions and Gradients of Compliance (SCI 0642500)
- 2014: Wyss Institute for Biologically Inspired Engineering, Harvard University (US)
Soft Robotics General Meeting: Finite Element Analysis of Soft Liquid Embedded Strain Sensors
- 2014: School of Engineering and Applied Sciences, Harvard University (US)
Mech & Math: Instabilities in Pressure-Volume relation of inflatable Membranes
- 2014: Graduate School of Design, Harvard University (US)
Guest Lecturer in Computational Material Distributions and Gradients of Compliance (SCI 0642500)
- 2012: School of Engineering and Applied Sciences, Harvard University (US)
Mech & Math: Shape Optimization of Soft Periodic Structures
- 2010: School of Engineering and Applied Sciences, Harvard University (US)
Abaqus Masterclass

CONFERENCES & COLLOQUIA TALKS

- (90) **Comoretto, A., Overvelde, J.T.B.**, (2023) Fluidic memory and sensing for autonomous soft robots, Autonomous Matter Symposium @AMOLF, Amsterdam, (NL). *Poster*.
- (89) **Schomaker, M., Picella, S., Kung, A., Van Laake, L.C., Overvelde, J.T.B.**, (2023) Decentralized control in soft robots: distributing the brain over the body, Autonomous Matter Symposium @AMOLF, Amsterdam, (NL). *Poster*.
- (88) **Ducarme, P.**, Weber, B., Van Hecke, M., **Overvelde, J.T.B.**, (2023) Unique structural functions enabled by a novel mechanical instability, Autonomous Matter Symposium @AMOLF, Amsterdam, (NL). *Poster*.
- (87) **Mohanty, S., Overvelde, J.T.B.**, (2023) Bridging the size-gap in soft robots, Autonomous Matter Symposium @AMOLF, Amsterdam, (NL). *Poster*.
- (86) **Van Riet, K., Zou, S., Overvelde, J.T.B.**, (2023) Soft Circuits Toolkit, Autonomous Matter Symposium @AMOLF, Amsterdam, (NL). *Poster*.
- (85) **Overvelde, J.T.B.**, (2022) Towards Autonomous Soft Robots by Using Smart Fluidic Circuits, Soft Robotics Summer School, Delft, (NL). *Presentation*.
- (84) **Schomaker, M., Picella, S., Kung, A., Van Laake, L.C., Overvelde, J.T.B.**, (2022) Decentralized control in soft robots: distributing the brain over the body, Klein Colloquium @ AMOLF, Amsterdam, (NL). *Presentation*.
- (83) **Comoretto, A., Overvelde, J.T.B.**, (2022) Fluidic memory and sensing for autonomous soft robots, GRC Gordon Robotics, Ventura, (US). *Presentation*.
- (82) **Schomaker, M., Picella, S., Kung, A., Van Laake, L.C., Overvelde, J.T.B.**, (2022) Decentralized control in soft robots: distributing the brain over the body, GRC Gordon Robotics, Ventura, (US). *Presentation*.
- (81) **Ducarme, P.**, Weber, B., Van Hecke, M., **Overvelde, J.T.B.**, (2022) Design of a mechanical metamaterial with a negative-displacement transition, ASML Tech Meeting, Veldhoven, (NL). *Presentation*.
- (80) **Picella, S., Overvelde, J.T.B.**, (2022) Towards emergent behavior in modular soft robots, ICMS Annual Symposium, Eindhoven, (NL). *Poster*.
- (79) **Zou, S., De Vries, J., Picella, S., Kortman, V., Sakes, A., Overvelde, J.T.B.**, (2022) Can a Soft Actuator Be a Sensor? Klein Colloquium @AMOLF, Amsterdam, (NL). *Presentation*.
- (78) **Schomaker, M., Picella, S., Kung, A., Van Laake, L.C., Overvelde, J.T.B.**, (2023) Decentralized control in soft robots: distributing the brain over the body, APS March Meeting. Las Vegas, (US). *Presentation*.
- (77) **Comoretto, A., Overvelde, J.T.B.**, (2023) Fluidic memory and sensing for autonomous soft robots, APS March Meeting, Las Vegas, (US). *Presentation*.
- (76) **Ducarme, P.**, Weber, B., Van Hecke, M., **Overvelde, J.T.B.**, (2023) Exotic properties enabled by counter-snapping instabilities, APS March Meeting, Las Vegas, (US). *Presentation*.

- (75) **Picella, S., Van Riet, K., Overvelde, J.T.B.**, (2023) Endowing soft robots with counting capabilities, APS March Meeting, Las Vegas, (US). *Presentation*.
- (74) **Arfaee, M., Kluin, J., Overvelde, J.T.B.**, (2023) Modeling the behavior of elastic pouch motors, IEEE Robosoft conference, Singapore, (SG). *Presentation*.
- (73) **Overvelde, J.T.B.**, (2022) Soft Robotic Matter group, Shaping the Future of Robotics through Material Innovation, Kreuth, (DE). *Presentation*.
- (72) **Comoretto, A., Overvelde, J.T.B.**, (2022) Smart fluidic circuits for electronics-free untethered soft robots, APS March Meeting 2022, Chicago, (US). *Presentation*.
- (71) **Comoretto, A., Overvelde, J.T.B.**, (2022) Fluidic memory and sensing for autonomous soft robots, ESMC 2022, Galway, (IE). *Presentation*.
- (70) **Comoretto, A., Overvelde, J.T.B.**, (2022) Fluidic memory and sensing for autonomous soft robots, Dutch Soft Robotics Symposium 2022, Delft, (NL). *Presentation*.
- (69) **Schomaker, M., Picella, S., Kung, A., Van Laake, L.C., Overvelde, J.T.B.**, (2022) Decentralized control in soft robots: distributing the brain over the body, APS March Meeting, Chicago, (US). *Presentation*.
- (68) **Zou, S., De Vries, J., Picella, S., Kortman, V., Sakes, A., Overvelde, J.T.B.**, (2022) A Universal Fluidic Sensing Strategy for Soft Robots, Dutch Soft Robotics Symposium, Delft, (NL). *Presentation*.
- (67) **Zou, S., Overvelde, J.T.B.**, (2022) Towards Soft Autonomous Robots with Smart Fluidic Circuits, 2022 Shaping the Future of Robotics through Material Innovation, Kreuth, (DE). *Poster*.
- (66) **Zou, S., De Vries, J., Picella, S., Kortman, V., Sakes, A., Overvelde, J.T.B.**, (2022) Can a Soft Actuator Be a Sensor? 31st Dutch Soft Matter Meeting, Delft, (NL). *Presentation*.
- Presentation*.
- (65) **Van Laake, L.C., Overvelde, J.T.B.** (2022) Reprogrammable Sequential Activation of soft Actuators, IEEE Robosoft conference. Edinburgh, (IE). *Presentation*.
- (64) **Van Laake, L.C., Overvelde, J.T.B.** (2022) Non-linear Fluidic Control Circuits Enable Autonomy in Soft Robotics, International Workshop on Embodied Intelligence. *Online Presentation*.
- (63) **Van Laake, L.C., Overvelde, J.T.B.** (2022) Experimental Characterization and Numerical Simulation of Soft total Artificial Hearts, ESMC (IE). *Presentation*.
- (62) **Van Laake, L.C., Overvelde, J.T.B.** (2022) Fluidic Control of Soft Robots for Future Medical Applications, HTRIC kick-off event, Groningen (NL). *Invited presentation*.
- (61) **Zou, S., De Vries, J., Picella, S., Kortman, V., Sakes, A., Overvelde, J.T.B.**, (2022). Can a soft actuator be a sensor. Dutch Soft Matter Meeting. Delft (NL). *Presentation*.
- (60) **Zou, S., De Vries, J., Picella, S., Kortman, V., Sakes, A., Overvelde, J.T.B.**, (2022). Can a soft actuator be a sensor. Klein Colloquium @AMOLF. Amsterdam (NL). *Presentation*.
- (59) **Schomaker, M., Picella, S., Kung, A., Van Laake, L.C., Overvelde, J.T.B.**, (2022). Towards emergent control with minimal resources. Klein Colloquium @AMOLF. Amsterdam (NL). *Presentation*.
- (58) **Comoretto, A., Van Laake, L.C., Overvelde, J.T.B.**, (2022) Smart fluidic circuits for electronics-free untethered soft robots. APS March meeting. Chicago (US). *Presentation*.
- (57) **Schomaker, M., Picella, S., Kung, A., Van Laake, L.C., Overvelde, J.T.B.**, (2022). Harnessing stigmergy for emergent adaptive control, in soft modular systems. APS March meeting. Chicago (US). *Presentation*.
- (56) **Arfaee, M., Overvelde, J.T.B., Kluin, J.**, (2021). A soft robotic fluidic transmission systems. ICTAM. (US). *Online poster*.
- (55) **Van Laake, L.C., Overvelde, J.T.B.**, (2021). A heartbeat for soft robots. Physics@Veldhoven, Veldhoven (NL). *Online presentation*.
- (54) **Van Laake, L.C., Overvelde, J.T.B.**, (2021). Responsive and mechanically programmable sequential actuation of fluid-driven soft actuators. Conversations on Bioinspired Engineering. (US). *Online presentation*.
- (53) **Wruck, F., Overvelde, J.T.B.**, Tans, S., (2021). Stochastic Molecular Matter. ICMS annual symposium TU/e. (NL). *Online poster*.
- (52) **Schomaker, M., Picella, S., Overvelde, J.T.B.**, (2021). Towards the design of emergent phenomena in robotic materials. ICMS annual symposium TU/e. (NL). *Online poster*.

- (51) Schomaker, M., Comoretto, A., (2021). Soft robotic research at AMOLF. AUC springboard event. (NL). *Online poster*.
- (50) Arfaee, M., Overvelde, J.T.B., Kluin, J., (2021). A soft robotic fluidic transmission systems. SES. (US). *Online poster*.
- (49) Van Laake, L.C., De Vries, J., Malek Kani, S., Overvelde, J.T.B., (2021). Responsive and mechanically programmable sequential actuation of fluid-driven soft actuators. SES. (US). *Online poster*.
- (48) Schomaker, M., Picella, S., Overvelde, J.T.B., (2021). Towards decentralized emergent control in dynamic locomotion tasks. SES. (US). *Online poster*.
- (47) Iniguez-Rabago, A., Overvelde, J.T.B., (2021). Elastic origami metamaterials and how to control their folding behavior. EMI2021-IC. Durham (UK). *Online presentation*.
- (46) Iniguez-Rabago, A., Overvelde, J.T.B., (2021). Elastic origami metamaterials and how to control their folding behavior. Physics@Veldhoven. Veldhoven (NL). *Online presentation*.
- (45) Van Laake, L., Malek Kani, S., Overvelde, J.T.B., (2020). Programming Soft Robots Using Non-linear Fluidic Circuits. Physics@Veldhoven. Veldhoven (NL). *Poster*.
- (44) Iniguez-Rabago, A., Milleret, A., Overvelde, J.T.B., (2020). Towards Origami Tessellations with Bistable Folds. Gordon Conference - Multifunctional Materials and Structures. Ventura (US). *Poster*.
- (43) Oliveri, G., Van Laake, L., Carissimo, C., Miette, C., Overvelde, J.T.B., (2020). Decentralized Reinforced Learning of Emergent Behavior in Robotic Matter. Gordon Conference - Multifunctional Materials and Structures, Ventura (US). *Poster*.
- (42) Oliveri, G., Overvelde, J.T.B., (2020). Inverse Design of Mechanical Metamaterials that Undergo Buckling. Gordon Conference - Multifunctional Materials and Structures, Ventura (US). *Poster*.
- (41) Van Laake, L., Malek Kani, S., Overvelde, J.T.B., (2020). Programming Soft Robots Using Non-linear Fluidic Circuits. Gordon Conference - Robotics. Ventura (US). *Poster*.
- (40) Oliveri, G., Van Laake, L., Carissimo, C., Miette, C., Overvelde, J.T.B., (2020). Decentralized Reinforced Learning of Emergent Behavior in Robotic Matter. Gordon Conference - Robotics, Ventura (US). *Poster*.
- (39) Van Laake, L., Malek Kani, S., Overvelde, J.T.B., (2019). Towards Fully Soft Robots Using Fluidic Circuits. Chains. Veldhoven (NL). *Invited presentation*.
- (38) Oliveri, G., Van Laake, L., Carissimo, C., Miette, C., Overvelde, J.T.B., (2019). Adaptive and Self-learning Robotic Matter. SES. St. Louis (US). *Presentation*.
- (37) Van Laake, L., Malek Kani, S., Overvelde, J.T.B., (2019). Responsive and Mechanically Programmable Sequential Actuation of Fluid-driven Soft Actuators. SES. St. Louis (US). *Presentation*.
- (36) van Laake, L., Overvelde, J.T.B., (2019). A Heartbeat for Soft Robots. Klein Colloquium @AMOLF. Amsterdam (NL). *Presentation*.
- (35) Oliveri, G., Van Laake, L., Carissimo, C., Miette, C., Overvelde, J.T.B., (2019). Decentralized Reinforced Learning of Emergent Behavior in Robotic Matter. Soft Matter Meeting. Utrecht (NL). *Soundbite presentation*.
- (34) Iniguez-Rabago, A., Overvelde, J.T.B., (2019). Boundary Effects in Origami Tessellations with Bistable Folds. Soft Matter Meeting. Utrecht (NL). *Soundbite presentation*.
- (33) van Laake, L., Overvelde, J.T.B., (2019). A Heartbeat for Soft Robots. Soft Matter Meeting. Eindhoven, Netherlands (NL). *Soundbite presentation*.
- (32) Van Laake, L., Iniguez-Rabago, A., Oliveri, G., (2019). Soft Robotics Research at AMOLF. Springboard 2019 @AUC. Amsterdam (NL). *Invited presentation*.
- (31) van Laake, L., Overvelde, J.T.B., (2019). Soft Fluidic Networks Driving Soft Robots. Workshop ESPCI-UVA-AMOLF. Amsterdam, Netherlands (NL). *Invited presentation*.
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- (10) **Overvelde, J.T.B.**, Bertoldi, K., (2015). Amplifying the Response of Soft Actuators by Harnessing Instability. New England Workshop on the Mechanics of Materials and Structures. Boston (US). *Movie*.
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- (7) Herkewitz, William. (2015) “Nearly Unbreakable Soft Robot Ignites Explosions to Jump.” New Technology, Popular Mechanics 9 July. [\[web\]](#)
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- (5) Martiradonna, Luigi. (2014) “Heart Twists.” Research Highlight, Nature Materials Vol. 13 January. [\[pdf\]](#)
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- (1) Elshof, Loes. (2009) “Excellence Program.” TU Delft. [\[video\]](#)

DOCUMENTARIES, EXHIBITIONS & DEMONSTRATIONS

- (9) “Soft Robotics” (May 2022), demonstration at NWO Teknowledgy festival, Utrecht (NL).
- (8) “Designing with Mathemagic” (Feb 2020), workshop at Amsterdam University of Applied Sciences, Amsterdam (NL).
- (7) “Bouw een wiskundige figuur” (Feb 2019), workshop and exhibit at NEMO, Amsterdam (NL).
- (6) “RainMaker” (Sep 2018), exhibition at FabLearn and Maker Faire (*Winner of the Maker of Merit Award*), Eindhoven (NL).
- (5) “Frankie - The artificial starfish” (Mar 2018 - Oct 2018), exhibition at Rijksmuseum Boerhaave, Leiden (NL)
- (4) “Edge of Chaos” (Dec 2017 - Jan 2019), exhibition on world tour at (WoeLab in Lomé (TG); La Gaîté Lyrique in Paris (FR); Cinekid in Amsterdam (NL); KIKK Festival in Namur (BE).
- (3) “Morphing Crystals” ((Dec 2017 - Present), exhibition at Rijksmuseum Boerhaave, Leiden (NL)
- (2) “10 Degrees” (Sept 2016 - Jan 2017), exhibition at Le Laboratoire, Cambridge (US)
- (1) “The Origami Code” (2016), documentary by Francois-Xavier Vives, Dutch premiere INScience, aired NPO on 6 Nov. (min 32:49 - 35:01)

DISSERTATIONS

PhD

- (3) Iniguez-Rabago, A., (2021) “Folding behavior of elastic origami metamaterials”. Eindhoven University of Technology.
- (2) Oliveri, G., (2021) “Designing Optimal Behaviour in Mechanical and Robotic Metamaterials”. Eindhoven University of Technology.
- (1) Overvelde, J.T.B., (2016) “Embracing Compliance and Instabilities to Achieve Function in Mechanical Metamaterials and Devices”. Harvard University. [\[pdf\]](#)

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- (15) L. Galassi, (2023) “Design of a soft actuation system based on mechanical instability for an artificial heart ventricle”, Scuola Superiore Sant’Anna,
- (14) Tait, J., (2022) “Dynamic DNA Origami: Harnessing Stochasticity for Synthetic Materials”. University of Edinburgh.
- (13) Collaris, M., (2022) “Macro sized elastomeric membrane oscillator towards fluidic control of soft robots”. Utrecht University.
- (12) Vara Fernandez, M., (2021) “Towards the fluidic control of a total soft artificial heart”. Groningen University.
- (11) Comoretto, A., (2021) “Design of soft buckling valve for pulsatile actuation of soft robots”.
- (10) De Vries, J., (2021) “Energy efficiency of soft pneumatic extension actuators”. Delft University.
- (9) Picella, S., (2021) “Distributed learning of emergent behaviour in 2D robotic matter”. Utrecht University.

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- (7) Carissimo, C., (2020) “On a soft robot and the emergence of behaviour”. University of Amsterdam.
- (6) Galiti, D., (2020) “Study of efficiency on pneumatic networks for an artificial heart”. Aristotle University of Thessaloniki.
- (5) Pasman, A. (2019) “Development of a volume adaptive soft robotic innersocket for transtibial prostheses”. University of Twente.
- (4) Jongerius, R., (2018) “Design and fabrication of a soft robotic fabric”. University of Twente.
- (3) Mula, D., (2017) “Simulation and design of a soft actuated metamaterials”. Ecole Centrale Paris, Polytechnic University of Valencia.
- (2) Sabdadini, A. (2016). “From rigid extruded polyhedral to highly deformable multistable metamaterials: a numerical exploration”. Leiden University.
- (1) Overvelde, J.T.B., (2012). “The Moving Node Approach in Topology Optimization - An Exploration to a Flow-inspired Meshless Method-based Topology Optimization Method”. Delft University of Technology. [\[pdf\]](#)

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- (4) Ashworth, S., (2020). “Efficient simulation of soft matter using coarsefinite element analysis”. Amsterdam University College.
- (3) Dickhoff, L., (2018) “Self-learning of Crawling Gaits in Worm-inspired Robots”. Amsterdam University College.
- (2) Ten Hooven, M., (2017) “Hybrid Heart: Soft pump design and proof of concept”. The Hague University of Applied Sciences.
- (1) Li, Y., (2017) “Identifying meta-stable states in Origami-Inspired reconfigurable metamaterials”. Amsterdam University College.

PATENTS

- (3) **Van Laake, L.C., Overvelde, J.T.B.**, (2022), Fluidic Control of Soft Robots. *US provisional patent application*.
- (2) Bertoldi, K., **Overvelde, J. T. B.**, Kloek, T., (2017). Amplifying the Response of Soft Fluidic Actuators By Harnessing Snap-through Instabilities. *US Patent Application*, US20170234337A1. [\[web\]](#)
- (1) Bartlett, N., Weaver, J. C., Tolley, M. T., Wood, R. J., **Overvelde, J. T. B.**, Bertoldi, K., (2016). 3D Printed Hybrid robot. *Worldwide Patent Application*, WO2017058334A9. [\[web\]](#)

CONFERENCE PROCEEDINGS

- (1) Abramovic, V., Glynn, R., **Overvelde, J. T. B.**, (2018) Edge of Chaos: Towards intelligent architecture through distributed control systems based on Cellular Automata. *ACADIA conf. proc.*

JOURNAL PUBLICATIONS

- (31) Schomaker, M., Picella, S., Kung Garcia, A., Van Laake, L.C., Overvelde, J.T.B., Stigmergy in two-dimensional modular robotic systems. *submitted*
- (30) **Van Laake, L.C.,* Comoretto, A.,* Overvelde, J.T.B.**, On the coexistence of pressure regulation and oscillation modes in soft hysteretic valves. *submitted*
- (29) Zrinscak, D., Lorenzon, L., De Chirico, C.M., Coluccia, F., De Luca, M., Maselli, M., **Overvelde, J.T.B.**, Cianchetti, M., Design of a Soft Robotic Artificial Cardiac Matrix. *submitted*
- (28) **Zou., S., Picella, S., De Vries, J.**, Kortman, V., Sakes, A., **Overvelde, J.T.B.**, A Retrofit Sensing Strategy for Soft Fluidic Robots. *submitted*
- (27) Kropacek, J., Maslen, C., Van Dijk, B., **Iniguez-Rabago, A., Overvelde, J.T.B.**, Zubov, A., Vrba, J., Cigler, P., Stepanek, F., Rehor, I., (2023) Hydrogel Microrobots Self-Assembled into Ordered Structures with Programmable Actuation. *Advanced Intelligent Systems*. [\[web\]](#)
- (26) **Wilt, J.K., Overvelde, J.T.B.**, Coulais, C., (2023) Shape Memory Soft Robots with Yield Stress Fluids. *Advanced Intelligent Systems*. [\[web\]](#)

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- (23) Vis, A., **Arfaee, M.**, Khambati, H., Slaughter, M.S., Gummert, J.F., **Overvelde, J.T.B.**, Kluin, J., (2022) The Ongoing Quest for the first total artificial heart as destination therapy. *Nature Reviews Cardiology*. [\[Read only pdf\]](#) [\[web\]](#)
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- (20) Röhrich, R., **Oliveri, G.**, Kovaivos, S., Tenner, V., Den Boef, A., **Overvelde, J.T.B.**, Koenderink, A.F., (2020) Uncertainty estimation and design optimization of 2D diffraction-based overlay metrology targets. *ACS Photonics*. [\[web\]](#)
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- (14) Wang, Z., Galloway, K., **Overvelde, J. T. B.**, Polygerinos, P., Bertoldi, K., Walsh, C. J., (2016). Interaction Forces of Soft Fiber Reinforced Bending Actuators. *IEEE/ASME Transactions on Mechatronics*. [\[web\]](#) [\[pdf\]](#)
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