

ANTONIO E. FORTE

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Associate Professor working at the intersection of robotics, mechanical metamaterials, and intelligent physical systems. Research focuses on programmable matter, soft robotic manipulation, adaptive structures, and physically embodied intelligence. Combines mechanics, fabrication, machine learning, and robotic control to develop reconfigurable material systems and next-generation robotic platforms.

CAREER PATH

University of Oxford, UK

September 2025 - Present

Associate Professor of Engineering Science

Tutorial Fellow at Pembroke College

Lead of RADlab — *Reconfigurable and Adaptive Designs Lab*.

Current PhD students: B. Barakat, Y. Wang, M. Adlerstein. Joining in 2026: D. Tumarada, P. Tanousis.

Postdocs: A. Rezanejad, J. Yao, M. Mousa. Joining in 2026: H. Oliviera, S. Jafarzadeh.

King's College London, UK

August 2021 - August 2025

Associate Professor in Engineering

Lead of RADlab — *Reconfigurable and Adaptive Designs Lab*.

Harvard University, USA

October 2018 - August 2021

Marie Curie Postdoctoral Fellow at the John A. Paulson School of Engineering and Applied Sciences — *Mechanical Metamaterials, Soft Systems, Inverse Design & Optimisation*. Advisor: [Prof Katia Bertoldi](#).

Imperial College London, UK

January 2016 - September 2018

Postdoc in Bioengineering — *Signal Processing & Machine Learning*. Advisor: [Prof Tobias Reichenbach](#).

Imperial College London, UK

October 2011 - December 2015

PhD in Mechanical Engineering — *Materials Design, Biomechanics, Finite Element Modelling*.

Advisor: [Prof Daniele Dini](#).

AWARDS AND GRANTS

2026 - *Best Extended Abstract* (≥ 220 submissions) — IEEE Robosoft 2026 with PhD Student Yuxuan Wang.

2026 - *MRC GapFund* — Precision-Printed Hydrogels: Treating Oesophageal Strictures Through Engineered Expansion (Co-I)

2025 - *Marie Curie Fellowship* — Supported (and helped writing) Hugo Oliviera's Fellowship proposal, which was awarded with an outstanding 99/100. Hugo will be joining my group at Oxford in November 2026.

2025 - *DFE-International Fellowship* — Supported (and helped writing) Sina Jafarzadeh's Fellowship proposal, which was successful. Sina will be joining my group at Oxford in December 2026.

2024 - *EPSRC Impact Accelerator Award* — Entangled Granular Metamaterials (PI)

2024 - *KCL Commercial Development Fund* — TangleHold Gripping Technology (Co-I)

2023 - *UKRI Future Leaders Fellowship* - Started in June 2024 (duration 4yrs + 3yrs renewal)
NARMM: Neural-driven, Active and Reconfigurable Mechanical Metamaterials (PI)

2023 - *EPSRC Impact Accelerator Award* — Helix EXtrusion GRIPper: HEXGRIP (PI)

2022 - *MRC Impact acceleration fund* — Wearable system for the early detection of heart valve diseases (Co-I)

2018 - *EU Marie Curie Individual Fellowship (GLOBAL)* at Harvard University (PI)

Other: NMES Faculty Enterprise & Engagement Award, Departmental Recognition Award, NMES Faculty Teaching Award, King's Artists Residency Award, FHEA, various travel grants & outstanding student awards, 10 journal covers for outstanding results.

TEACHING EXPERIENCE

Y3 Group Project – University of Oxford, UK (2025/26, Michaelmas, Hilary and Trinity terms)

P3 and A3 Tutorials – University of Oxford, UK (2025/26, Michaelmas, Hilary and Trinity terms)

- Taught and marked tutorials to small groups of first and second year undergrads (statics, dynamics, structures, mechanics of materials, fracture mechanics, etc.)

Module Lead – King’s College London, UK (2022/23/24, Spring term)

- Designed, taught and marked the Finite Element Analysis module (6CCE3FEA, ~80 students)

Module Lead – King’s College London, UK (2021/22/23, Autumn term)

- Designed, taught and marked the Design:Empowerment module (5CCE2EMP, ~240 students)

Group Project Supervisor for MSc Robotics – King’s College London, UK (2023/24, all-year)

- Leading MSc students on building and testing of wearable robotic metamaterials (7CCEMRGP)

Supporting Lecturer – King’s College London, UK (2021-24, Autumn term)

- Designed, taught and marked the tutorials for the Materials module (5CCE2MAT, ~80 students)
- Designed and taught CAD tutorials for the Design:KEP module (4CCE1KEP, ~240 students)
- Supervisor, guided groups of students in their RC boat designs (4CCE1MCP, ~240 students)
- Marker for Mechanics module (4CCE1MEC, ~200 students)

Teaching Assistant – Imperial College, UK (2017, Autumn term)

- Taught (with Prof Reichenbach) the Statistics and Data Analysis module (BE9-MSTDA, ~80 students)

Teaching Assistant – Imperial College, UK (September 2011 – December 2015)

- Taught (with Prof Dini) and marked the Stress Analysis module (ME1-HSAN, ~100 students, 2 terms)
- Supported laboratory sessions for Materials module (ME1-HMATL, 1 term)

Student Mentoring and Supervision

- King’s College London, UK (August 2021 – Present)
 - 1st supervisor, PhDs: M. Mousa, A. Rezanejad, B. Barakat, Y. Wang, M. Adlerstein
 - 2nd supervisor, PhDs: Y. Lu, K. Arcovio, M. Li
 - Supervisor of 4 UG Research Fellows: L. Jaber, N. Hashmi, Y. Sohn, A. Zenagui
 - Supervisor for 12 UG, 8 MSc Individual Projects, 2 MSc Group Projects (~10 students)
- Harvard University, US (October 2018 – August 2021)
 - Co-supervised 5 PhDs, 2 UG and 4 MSc visiting students
- Imperial College, UK (September 2011 – October 2018)
 - Co-supervised 5 PhDs, 3 UG and 5 MSc students

PROFESSIONAL AND ADMINISTRATIVE ROLES

• Scientific Peer Review

Advanced Functional Materials — Advanced Engineering Materials — Biomechanics and Modeling in Mechanobiology — Annals of Biomedical Engineering — JMBBM — Biomedical Physics and Engineering Express (BPEX) — International Journal of Solids and Structures — Materials Science & Engineering C — Materials & Design — Progress in Additive Manufacturing — Journal of Biomechanics — Materialia — IEEE Access — IRBM — Journal of Physics D: Applied Physics — Acta Materialia — Soft Matter...

• Service Roles for funding bodies, scientific meetings and outreach

- Reviewer for EPSRC, Springboard Awards, the Leverhulme Trust, and the European Commission

- Organizer & Chair of the *"Functionality via nonlinearities"* session at APS Global Physics Summit
- Organiser of the *Creative Differences Workshop*, in collaboration with the London Biennale
- Member of the UKMMN, APS, IEEE, RAS, Automorph Network...
- Testimonial for British Science Week, Pint of Science, European Researcher Night, MEETmeTONIGHT...

• Service Roles

- Coordinator for the 2nd year UG Engineering Curriculum, NMES Systems Development Sub-Committee
- Recruitment panels for PDRAs and Academic positions, PhD Upgrade Examiner (panel chair)
- Led procurement of Departmental equipment and creation of Virtual Machine Framework
- Health and Safety committee Fellow at Pembroke College

INVITED TALKS (LAST 5 YEARS)

KU Leuven, FTM2026 Conference ("the future of physical control: intelligence in mechanical matter", 06/26) — Southampton University Distinguished Lecture ("Mechanical Metamaterials: blurring the line between machines and matter", 05/26) — IEEE Robosoft 2026 ("Nonlinear Physical Intelligence in Soft Machines", 04/26) — KU Leuven (Soft Robotics PhD Conference, 11/24) — Harvard University (Bertoldi Applied Mechanics Seminar, 10/24) — Nile University (NILES2024 – IEEE, 10/24 (keynote speaker) — Imperial College London (Hamlyn Symposium, 06/24) — AMOLF (workshop, 05/24) — Imperial OncoEng Conference 01/24 (keynote speaker) — Oxford University (5th UK Robot Manipulation Workshop, 01/24) — Oxford University (Solid Mechanics and Materials Engineering Seminar, 11/23) — UCL (Lighten workshop, 10/23) — University of Bath (Shape Morphing Metamaterials Workshop, UKMMN, 09/23) — Somerset House (Automorph Workshop, 06/23) — University of Bristol (Softlab Seminar Series, 06/22) — UCL (Lighten workshop, 05/22) — SIAMM21, 02/21 (keynote speaker) — UCL (Dept of Mech Eng, 01/21) — Warwick University (Dept of Mech Eng, 10/20) — MSE2020, 09/2020 (keynote speaker) — EMI2020 (Columbia University, 05/20 - cancelled due to COVID) — Boston University (Dept of Mech Eng Seminar, 03/20) — Imperial College London (Bioengineering Dept, 02/20) — Boston University (Moss Lab Seminar Series, 01/20)

PUBLICATIONS



Figure 1: Awarded journal covers and Google Scholar metrics (05/2026)

(#Corresponding Author; †Joint First Authorship; Last Author;

1. S. A. Pope, D. J. Roth, A. Bansal, M. Mousa, A. Rezanejad, **A. E. Forte...** (2026). The 2026 active metamaterials roadmap. *Journal of Physics D: Applied Physics*
2. A. Rezanejad, M. Mousa, Y. Wang, M. Adlerstein, J. Yao, **A. E. Forte#** (2026). Vacuum–Laser Fabrication of Programmable Soft Actuators. *Advanced Science* (awarded journal cover).
3. M. Mousa, A. Comoretto, B. Overvelde, **A. E. Forte#** (2026). Multifunctional Fluidic units for Emergent, Responsive Robotic Behaviours. *Advanced Materials* (awarded journal cover).

4. A. Rezanejad, M. Mousa, C. D. Lorenz, M. Howard, **A. E. Forte#** (2025). Programmable Entanglement of Granular Mechanical Metamaterials. *Advanced Functional Materials* (awarded journal cover).
5. D. T. Farrell, C. M. McCann, **A. E. Forte**, C. J. Walsh, K. Bertoldi (2025). Programmable Surface Dimpling of Textile Metamaterials for Aerodynamic Control. *Advanced Materials*. (awarded journal cover).
6. M. Mousa, A. Rezanejad, B. Gorissen, **A. E. Forte#** (2024). Frequency-Controlled Fluidic Oscillators for Soft Robots. *Advanced Science* (awarded journal cover).
7. Y. Yang, H. Read, M. Sbail, A. Zareei, **A. E. Forte**, D. Melancon, K. Bertoldi (2024). Complex Deformation in Soft Cylindrical Structures via Programmable Sequential Instabilities. *Advanced Materials* (awarded journal cover).
8. A. Rezanejad, M. Mousa, M. Howard, **A. E. Forte #** (2024). Complex picking via entanglement of granular mechanical metamaterials. *arXiv*.
9. **A. E. Forte#**[†], D Melancon[†], M Zanati, M De Giorgi, K Bertoldi# (2023). Chiral Mechanical Metamaterials for Tunable Optical Transmittance. *Advanced Functional Materials* (awarded journal cover).
10. D. Melancon[†], **A. E. Forte**[†], L. M. Kamp, B. Gorissen, K. Bertoldi(2022). Inflatable Origami: Multimodal Deformation via Multistability. *Advanced Functional Materials* (awarded journal cover).
11. M. C Fernandes, S. Mhatre, **A. E. Forte**, ... & K. Bertoldi (2022). Surface texture modulation via buckling in porous inclined mechanical metamaterials. *Extreme Mechanics Letters* (awarded journal cover).
12. **A. E. Forte#**, ... & K. Bertoldi# (2022). Inverse Design of Inflatable Soft Membranes Through Machine Learning. *Advanced Functional Materials*
13. A. Mazier, A. Bilger, **A. E. Forte**, ...& S. P. A. Bordas (2022). Inverse deformation analysis: an experimental and numerical assessment using the FEniCS Project. *Engineering with Computers*.
14. B. Deng, M. Zanati, **A. E. Forte**, K. Bertoldi (2022). Topological solitons make metamaterials crawl. *Physical Review Applied*.
15. L. Jin, **A. E. Forte** & K. Bertoldi (2021). Mechanical Valves for On-Board Flow Control of Inflatable Robots. *Advanced Science*.
16. M. Terzano, A. Spagnoli, D. Dini, **A. E. Forte** (2021). Fluid–solid interaction in the rate-dependent failure of brain tissue and biomimicking gels. *Journal of the Mechanical Behavior of Biomedical Materials*.
17. A. Dine, E. Bentley, L. A. Poulmarck, D. Dini, **A. E. Forte#**, Z. Tan# (2021). A dual nozzle 3D printing system for super soft composite hydrogels. *HardwareX*.
18. B. Deng[†], S. Yu[†], **A. E. Forte**, V. Tournat, K. Bertoldi (2020). Characterization, stability and application of domain walls in flexible mechanical metamaterials. *PNAS*.
19. L. Jin[†], **A. E. Forte**[†], ... & K. Bertoldi (2020). Kirigami-inspired inflatables with programmable shapes. *Advanced Materials* (awarded journal cover).
20. Z. Tan, J. P. Ewen, **A. E. Forte**, S. Galvan, E. De Momi, F. Rodriguez y Baena, D. Dini (2020). What does a brain feel like?. *Journal of Chemical Education*.
21. M. Saiz-Alia, **A. E. Forte** & T. Reichenbach (2019). Individual differences in the attentional modulation of the human auditory brainstem response to speech inform on speech-in-noise deficits. *Scientific Reports*.
22. G. Carpenter, ... **A. E. Forte**, ... & S. K. Baier (2019). A study of saliva lubrication using a compliant oral mimic. *Food Hydrocolloids*.
23. G. Binkhamis, **A. E. Forte**, ... & K. Kluk-De Kort (2019). Speech auditory brainstem responses in adult hearing aid users: Effects of aiding and background noise, and prediction of behavioral measures. *Trends in Hearing*.
24. O. Etard, ... **A. E. Forte** & T. Reichenbach (2019). Decoding of selective attention to continuous speech from the human auditory brainstem response. *Neuroimage*.
25. Z. Tan, ... & **A. E. Forte#** (2018). Composite hydrogel: A high fidelity soft tissue mimic for surgery. *Materials & Design*.

26. Z. Tan, ... & **A. E. Forte#** (2017). Cryogenic 3d printing of super soft hydrogels. *Scientific Reports*
27. **A. E. Forte**, O. Etard & T. Reichenbach (2017). The human auditory brainstem response to running speech reveals a subcortical mechanism for selective attention. *eLife*.
28. **A. E. Forte#**, S. Gentleman & D. Dini (2017). On the characterization of the heterogeneous mechanical response of human brain tissue. *Biomechanics and Modeling in Mechanobiology*.
29. **A. E. Forte#**, S. Galvan & D. Dini (2017). Models and tissue mimics for brain shift simulations. *Biomechanics and Modeling in Mechanobiology*.
30. **A. E. Forte#**, ... & D. Dini (2016). A composite hydrogel for brain tissue phantoms. *Materials & Design*.
31. A. Leibinger, **A. E. Forte**, ... & F. Rodriguez Y Baena (2016) Soft tissue phantoms for realistic needle insertion: a comparative study. *Annals of Biomedical Engineering*.
32. **A. E. Forte**, ... & J.G. Williams (2015). Modelling and experimental characterisation of the rate dependent fracture properties of gelatine gels. *Food Hydrocolloids*.
33. Das Neves Borges, **A. E. Forte**, ... & M. Marenzana (2014). Rapid, automated imaging of mouse articular cartilage by microCT for early detection of osteoarthritis and finite element modelling of joint mechanics. *Osteoarthritis and cartilage*.

PATENTS

1. Arcovio K., Yu Y., Rezanejad A., Mousa M., Alhnan M. A., Al-Jamal K., **Forte A. E.** ORAL DELIVERY OF BIOLOGICS – DELIVERY DEVICES (**P605923PC00**), King's College London, UK Patent Application (with 4 of my PhD students, 2 of which I first supervise).
2. Sun X., Al-Jamal K., Alhnan M. A., **Forte A. E.** ORAL DELIVERY OF BIOLOGICS – HYDROGEL (**P605922GB**), King's College London, UK Patent Application (successfully filed, with collaborators from the KCL Pharmaceutical Department).
3. Rezanejad A., Mousa M., Howard M., **Forte A. E.** A means to use tangling granular metamaterial to grip and manipulate materials and objects (**P44468GB**), King's College London, UK Patent Application (successfully filed, with 2 of my PhD students — PCT filed on 07/01/2025).

OTHER CONTRIBUTIONS

~30 contributions, including national/international conference papers (some of these are peer-reviewed), abstracts, posters, and codes, are hereby omitted.