Hadrien O Applied mathe Implied mathe Researchgat	liveri matician pipz.mpg.de ♥ @hadrienoliveri In LinkedIn te G Google Scholar ID 0000-0002-5488-5567 t History
2024–…	Max Planck Institute for Plant Breeding Research, Cologne, Germany Group Leader, Department of Comparative Development and Genetics.
2023–2024	Max Planck Institute of Molecular Cell Biology and Genetics, Center for Sys- tems Biology Dresden, Dresden, Germany
	ELBE Postdoctoral Research Fellow (03/2024–08/2024).
	 Postdoctoral Researcher (10/2023–03/2024), under supervision of Prof. Heather Harrington.
2019–2023	Mathematical Institute, University of Oxford, Oxford, United Kingdom
	 Postdoctoral Research Associate (09/2019–07/2023), under supervision of Prof. Alain Goriely
	- Destdesteral Desserb Associate (07/0000 10/0000) under supervision of

 Postdoctoral Research Associate (07/2023–10/2023), under supervision of Prof. Heather Harrington

Education

2015 – 2019	 Ph. D., University of Montpellier / Inria / ENS Lyon Computer Science. Defended on 28 May 2019 Thesis title: On the role of mechanical feedback in plant morphogenesis. Advisors: Dr Christophe Godin, Dr Jan Traas
2012 – 2015	M. Eng., Grenoble Institute of Technology Computer Science and Applied Mathematics (<i>Ensimag</i>). Thesis title: <i>Virtual pre-operative planning of acetabular fracture reduction using</i> <i>a patient-specific biomechanical model.</i>
2010 – 2012	<i>Classes préparatoires aux grandes écoles</i> , Lycée Vaugelas, Chambéry Mathematics and Physics. Two-year preparation for national competitive entrance exams leading to French <i>grandes écoles</i> , specialising in mathematics and physics. Ranked 309 th among 6938 candidates at the <i>concours communs polytechniques</i> .
Skills	
Languages Coding Mathematics	French (mother tongue), English (bilingual), Italian (bilingual), German (notions) Wolfram Mathematica, Python, LATEX Solid mechanics, mechanics of slender structures, dynamical systems, asymp-
	totics, ordinary and partial differential equations, scientific computing

Teaching and supervision

Tutorials	Tutor for first-year <i>Dynamics</i> , Somerville College, University of Oxford, 8 hours, 6 students (2022).
	Tutor for fourth-year <i>Solid Mechanics</i> , Mathematical Institute, University of Oxford, 6 hours, 15 students (2021).
Supervision	Group supervisor for <i>Case Studies in Mathematical Modelling</i> , Mathematical Institute, University of Oxford, 8 hours, 5 students (2022).
	Group supervisor for <i>Case Studies in Mathematical Modelling</i> , Mathematical Institute, University of Oxford, 8 hours, 5 students (2021).
	PhD assistant supervisor, assisting Prof. Alain Goriely in the supervision of 4 PhD students: weekly meetings, technical and scientific advising, design of re- search strategy & scientific writing.
	Study group co-supervisor Workshop <i>Modeling Shape and Size in Biological Development</i> (Lorentz Centre, Leiden, 2020).
Marking	Examiner for first-year <i>Geometry</i> final exam , Mathematical Institute, University of Oxford (2022).
	Examiner for fourth-year <i>Networks Mini-projects</i> , Mathematical Institute, University of Oxford (2021)

Miscellaneous Experience

Certifications

2024 **Qualification de droit commun** French lecturer certification.

Awards and Achievements

- 2022 Recognition Award for outstanding performance, Mathematical Institute, University of Oxford.
- 2021 **Best ECR talk prize** at the 6th Oxford International Neuron and Brain Mechanics Workshop, awarded by Elsevier.

Grants and fellowships

- 2021 2023 **Fulford Junior Research Fellowship** (non-stipendiary), Somerville College, University of Oxford.
- 2014 2015 **Erasmus+ scholarship**, 9 month exchange with *Politecnico di Torino*.

Other academic service

- Outreach **Oxford Maths Festival**, Public demonstrations of mathematical experiments to children (2023).
 - A slice of Science, Department of Archaeology, University of Oxford, Public talk (pub), Oxford (2023)
 - **JRF Research Forum**, talk, Somerville College, University of Oxford (2022).
 - **JRF Research Forum**, talk, Somerville College, University of Oxford (2021).
- Administration Co-organiser of the *Industrial and Applied Mathematics Seminar series*, Mathematical Institute, University of Oxford (2022–2023).

Miscellaneous Experience (continued)

- **Co-organiser of the Oxford Brain Modelling Seminar series**, Mathematical Institute, University of Oxford (2022).
- **Panel member** for the recruitment of a postdoctoral researcher, Mathematical Institute, University of Oxford (2021).
- **Peer-reviewer** for PNAS (2 reviews), Physical Review Letters (1 review), Phys-Peer-reviewing ical Review E (2 reviews), PLoS Computational Biology (2 reviews) and Brain Multiphysics (3 reviews).

Research Publications

* These authors contributed equally

Journal Articles

D. E. Moulton and **H. Oliveri**, "The mathematics and mechanics of tug of war," *Mathematics and* Mechanics of Solids, vol. 29, no. 6, pp. 1254-1270, Jan. 2024. Ø DOI: 10.1177/10812865231203154.



 H. Oliveri and A. Goriely, "Correction to: Mathematical models of neuronal growth," Biomechanics and Modeling in Mechanobiology, no. 21, pp. 89–118, Mar. 2024. *O* DOI: 10.1007/s10237-024-01831-9.

H. Oliveri, D. E. Moulton, H. A. Harrington, and A. Goriely, "Active shape control by plants in dynamic environments," Phys. Rev. E, vol. 110, no. 1, p. 014 405, Jul. 2024, Editor's suggestion. *S* DOI: 10.1103/PhysRevE.110.014405.

G. S. Brennan, T. B. Thompson, H. Oliveri, M. E. Rognes, and A. Goriely, "The role of clearance in neurodegenerative diseases," SIAM Journal on Applied Mathematics, vol. 84, no. 3, S172-S198, Jul. 2023. & DOI: 10.1137/22M1487801.

5 D. E. Moulton, H. Oliveri, A. Goriely, and C. J. Thorogood, "Mechanics reveals the role of peristome geometry in prey capture in carnivorous pitcher plants (Nepenthes)," Proceedings of the National Academy of Sciences of the United States of America, vol. 120, no. 38, e2306268120, Sep. 2023, featured on cover and issue's highlights. *P* DOI: 10.1073/pnas.2306268120.

6 P. Putra, H. Oliveri, T. Thompson, and A. Goriely, "Front propagation and arrival times in networks with application to neurodegenerative diseases," SIAM Journal on Applied Mathematics, vol. 83, no. 1, pp. 194–224, Feb. 2023. @ DOI: 10.1137/21M1467547.

H. Oliveri and A. Goriely, "Mathematical models of neuronal growth," *Biomechanics and* Modeling in Mechanobiology, vol. 21, pp. 89–118, Jan. 2022, ISSN: 1617-7940. @ DOI: 10.1007/S10237-021-01539-0.

B. H. Oliveri, R. de Rooij, E. Kuhl, and A. Goriely, "Rheology of growing axons," *Physical Review Research*, vol. 4, no. 3, p. 033125, Aug. 2022. *O* DOI: 10.1103/PhysRevResearch.4.033125.

9 M. Boudissa, G. Bahl, H. Oliveri, M. Chabanas, and J. Tonetti, "Virtual preoperative planning of acetabular fractures using patient-specific biomechanical simulation: A case-control study," Orthopaedics & Traumatology: Surgery & Research, vol. 107, no. 6, p. 103 004, 2021. & DOI: 10.1016/j.otsr.2021.103004.

10 M. Boudissa, B. Noblet, G. Bahl, et al., "Planning acetabular fracture reduction using a patient-specific biomechanical model: A prospective and comparative clinical study,"

International Journal of Computer Assisted Radiology and Surgery, vol. 16, pp. 1305–1317, **2021**. *O* DOI: 10.1007/s11548-021-02352-x.



H. Oliveri, K. Franze, and A. Goriely, "Theory for Durotactic Axon Guidance," *Physical Review* Letters, vol. 126, no. 11, p. 118 101, Mar. 2021, Editor's suggestion. & DOI: 10.1103/PhysRevLett.126.118101.

12 D. E. Moulton, H. Oliveri, and A. Goriely, "Multiscale integration of environmental stimuli in plant tropism produces complex behaviors," Proceedings of the National Academy of Sciences of the United States of America, vol. 117, no. 51, pp. 32226-32237, Dec. 2020. Ø DOI: 10.1073/pnas.2016025117.

13 F. Zhao*, F. Du*, H. Oliveri*, et al., "Microtubule-mediated wall anisotropy contributes to leaf blade flattening," Current Biology, vol. 30, no. 20, pp. 3972–3985, Sep. 2020. Ø DOI: 10.1016/j.cub.2020.07.076.

0. Ali, **H. Oliveri**, J. Traas, and C. Godin, "Simulating turgor-induced stress patterns in multilayered plant tissues," Bulletin of mathematical biology, pp. 1–23, 2019. @ DOI: 10.1007/s11538-019-00622-z.

15 M. Boudissa, H. Oliveri, M. Chabanas, and J. Tonetti, "Computer-assisted surgery in acetabular fractures: Virtual reduction of acetabular fracture using the first patient-specific biomechanical model simulator," Orthopaedics & Traumatology: Surgery & Research, vol. 104, no. 3, pp. 359-362, 2018. *O* DOI: 10.1016/j.otsr.2021.103004.

16 H. Oliveri, J. Traas, C. Godin, and O. Ali, "Regulation of plant cell wall stiffness by mechanical stress: A mesoscale physical model," Journal of mathematical biology, vol. 78, no. 3, pp. 625–653, 2018. Ø DOI: 10.1007/s00285-018-1286-y.

Preprints

A. Ahern, T. B. Thompson, **H. Oliveri**, S. Lorthois, and A. Goriely, *Modelling the coupling* between cerebrovascular pathology and amyloid beta spreading in Alzheimer's disease, In review, 2024.

H. Oliveri and I. Cheddadi, *Hydromechanical field theory of plant morphogenesis*, 2024.

Conference Proceedings

M. Boudissa, M. Chabanas, G. Bahl, H. Oliveri, and J. Tonetti, "Virtual pre-operative planning in acetabular surgery using a patient-specific biomechanical model: A prospective clinical study," in CAOS 2020. The 20th Annual Meeting of the International Society for Computer Assisted Orthopaedic Surgery, 2020. & URL: https://hal.science/hal-03185100.

2 M. Boudissa, H. Oliveri, M. Chabanas, P. Merloz, and J. Tonetti, "Pre-operative planning in acetabular surgery: The first patient-specific biomechanical model," in International Society of Computer-Assisted Orthopaedic Surgery, 17th Annual Scientific Meeting, Aachen, June 2017, vol. 99-B, 2017, pp. 18–18. *O* DOI: 10.1302/1358-992X.2017.20.018.

- **H. Oliveri**, M. Boudissa, J. Tonetti, and M. Chabanas, "Planning acetabular fracture reduction using patient-specific multibody simulation of the hip," in Medical Imaging 2017: Image-Guided Procedures, Robotic Interventions, and Modeling, R. J. W. III and B. Fei, Eds., International Society for Optics and Photonics, vol. 10135, SPIE, 2017, 101352P. & DOI: 10.1117/12.2250380.
- 4 M. Boudissa, M. Chabanas, H. Oliveri, and J. Tonetti, "Virtual fracture reduction of the acetabulum using a rigid body biomechanical model," in SURGETICA, 2014. @ URL: https://hal.science/hal-01233925.

Talks and Posters

1	"Active shape control by plants in dynamic environment," Symposium of the French "groupement de recherche" on Plant Physics (PhyP), Carry-le-Rouet, 2024.
2	"Field theory of plant morphogenesis," Workshop <i>Finite Elements for Cell and Tissue Morphogenesis</i> , Fréjus, 2024.
3	"Robust posture control by plants in dynamic gravity field," American Physical Society March Meeting, Minneapolis, 2024.
4	"The mathematics and mechanics of plant tropisms," Max Planck Institute for Plant Breeding Research (Invited), Cologne, 2024.
5	"Active shape control by plants in dynamic environment," <i>Oxford Cancer: Spatial Biology</i> Workshop (Poster), Oxford, 2023.
6	"The mathematics and mechanics of plant tropisms," Max Planck Institute for the Physics of Complex Systems (Invited), 2023.
7	"Tropism in living filaments: From plants to neurons," EPFL (Invited), Lausanne, 2023.
8	"A field theory for plant tropism," Workshop <i>Multiscale Modeling of Plant Growth, Pattern Formation, and Actuation</i> , Banff International Research Station, Casa Matemática, Oaxaca (Invited), 2022.
9	"A field theory for plant tropism," Université Libre de Bruxelles (Invited), Bruxelles, 2022.
10	"A field theory for plant tropism," 10 th International Plant Biomechanics Conference, Lyon, 2022.
1	"A field theory for plant tropism," Workshop Mechanics of Life, Flatiron Institute, New York, 2022.
12	"A field theory for plant tropism," Symposium of the French "groupement de recherche" on Plant Physics (PhyP), Carry-le-Rouet, 2022.
13	"An optic ray theory for nerve durotaxis," EMMC18, Oxford, 2022.
14	"Rheology of growing axons," Workshop <i>Bridging the Gap: from Brain Mechanics to Brain Dynamics</i> , Lorentz Centre, Leiden, 2022.
15	"Tropism in living filaments: From plants to neurons," Queen's University Belfast (Invited), Belfast, 2022.
16	"A multiscale mathematical theory for plant tropism," Department of Mathematical Sciences (Invited), University of Durham, Durham, 2021.
17	"An optic ray theory for nerve durotaxis," 5 th Soft Tissue Modelling Workshop, Glasgow, 2021.
18	"An optic ray theory for nerve durotaxis," Industrial and Applied Mathematics Seminar Series, Mathematical Institute (Invited), University of Oxford, Oxford, 2021.
19	"An optic ray theory for nerve durotaxis," 6th Oxford International Neuron and Brain Mechanics Workshop, Oxford, 2021.
20	"Morphogenesis of plant organs: Understanding the emergent behavior of stress-sensing tissues," 9 th International Plant Biomechanics Conference, Montreal, 2018.
21	"Stress-based regulation of multicellular plant growth: A finite element modeling approach applied to planar leaf morphogenesis," 19th International Conference on Systems Biology (Poster), Lyon, 2018.
22	"Force-sensing at the cell wall: A multiscale physical model," Symposium of the French "groupement de recherche" on Plant Physics (PhyP), Marseille, 2017.