

# Philippe Wyder

*Curriculum Vitae (February 2024)*

---

*Address* 220 S. W. Mudd Building, 500 W. 120th Street, NY, NY 10027  
*Phone* 347-604-4450  
*E-mail* [philippe.wyder@columbia.edu](mailto:philippe.wyder@columbia.edu)  
*Website* [www.philippewyder.com](http://www.philippewyder.com)  
*LinkedIn* [www.linkedin.com/in/philippewyder](http://www.linkedin.com/in/philippewyder)

## EDUCATION AND APPOINTMENTS

---

**Columbia University** 2019-2024  
*Ph.D. in Mechanical Engineering*  
*Advisor: Hod Lipson*  
*French Fellow*

**Columbia University** 2017-2019  
*M.S. in Mechanical Engineering*

**Columbia University** 2013-2017  
*B.A. in Computer Science*  
*AI and Philosophy track*  
*Magna Cum Laude*

## PUBLICATIONS

---

6. Wyder, P.M.; Bakhda, R.; Zhao, M.; Booth, Q.A.; Modi, M.E.; Kang, S.; Song, A.; Wu, J.; Patel, P.; Kasumi, R.T.; Yi, D.; Garg, N.N.; Bhutoria, S.; Jhunjhunwala, P.; Tong, E.H.; Mustel, O.; Kim, D.; Lipson, H. “Artificial Metabolism” Manuscript in revision.
5. Wyder, P.M.; Bakhda, R.; Zhao, M.; Booth, Q.A.; Modi, M.E.; Kang, S.; Song, A.; Wu, J.; Patel, P.; Kasumi, R.T.; Yi, D.; Garg, N.N.; Bhutoria, S.; Jhunjhunwala, P.; Tong, E.H.; Mustel, O.; Kim, D.; Lipson, H. “Robot Links: towards self-assembling truss robots” ReMar. Manuscript under review.
4. Battra, R.<sup>1</sup>; Wyder, P.M.<sup>1</sup>; Jhunjhunwala, P.; Xie, A.; Booth, Q.A., Lipson, H. “Soft Vibrating Particle Robot” Manuscript in revision.
3. Battra, R.<sup>1</sup>; Wyder, P.M.<sup>1</sup>; Jhunjhunwala, P.; Booth, Q.A.; Xie, A.; Small, B.G.; Lipson, H. “Vibrating Particle Robot” ReMar. Manuscript under review.
2. Wyder, P.M.; Lipson, H. “Visual design intuition: predicting dynamic properties of beams from raw cross-section images” *Journal of The Royal Society Interface*. 2021;18(184):20210571.
1. Wyder, P.M.; Chen, Y.; Lasrado, A.; Pelles, R. J.; Kwiatowski, R.; Comas, E. O. A.; Kennedy, R.; Mangla, A.; Huang, Z.; Hu, X.; Xiong, Z.; Aharoni, T.; Chuang, T.; Lipson, H. “Autonomous drone hunter operating by deep learning and all-onboard computations in GPS-denied environments” *PLOS ONE* 14(11): e0225092.

## TEACHING

---

*Columbia University*

- Spring 2023: **MECEE 4606: Digital Manufacturing**  
Lead TA. Course covered algorithmic design, generative design, additive manufacturing processes, and numerical control. Held weekly TA review sessions, trained students on Laser Cutters and embroidery machines, and managed ordering and distribution of student materials. 108 person class.
- Fall 2022: **MECSE 4510: Evolutionary Computation & Design**  
Graduate course covering genetic algorithms, genetic programming, and evolutionary optimization strategies, as well as governing dynamics of co-evolution and symbiosis. Held weekly recitation sessions for students, and provided updated homework assignments. Proctored and graded final exam. 60 person class.

---

<sup>1</sup>Both authors contributed equally

- Spring 2022: **MECEE 4606: Digital Manufacturing**  
Lead TA. Recruited and guided team of students who designed and built the next food printer generation. Held TA review sessions for both in-person and online separately. Course covered algorithmic design, generative design, additive manufacturing processes, and numerical control. 122 person class.
- Fall 2021: **MECSE 4510: Evolutionary Computation & Design**  
Graduate course covering genetic algorithms, genetic programming, and evolutionary optimization strategies, as well as governing dynamics of co-evolution and symbiosis. Developed course materials and code samples. 110 person class.
- Spring 2021: **MECEE 4606: Digital Manufacturing**  
Lead TA. Course was offered remotely due to COVID-19. Held recitation sessions, developed course materials, and guided students to build their own 3D printer. Course covered algorithmic design, generative design, additive manufacturing processes, and numerical control. 110 person class.

## **STUDENTS MENTORED**

---

28. **Simon Kang** (2023-2024) Camera tracking system development and closed-loop experiment implementation
27. **Gaurav Himanshu Patel** (2023) Modular robotics assembly, testing, repair, and operation.
26. **Pranav Jhunjhunwala** (2023) Modular robotics and particle robotics assembly and testing, and experiment execution.
25. **Aaron Xie** (2022-2023) Particle robot assembly and testing, and experiment execution.
24. **Riyaan Bakhda** (2021-2023) Modular robotics simulation development and control system design, firmware development, computer vision and tracking, and robot evolution.
23. **Meiqi Zhao** (2022-2023) Modular robotics simulation and control, experiment conceptualization and execution, and data collection and evaluation.
22. **Quinn A. Booth** (2022-2023) Modular robotics build and control, experiment construction, and experiment execution.
21. **Donghan Kim** (2022-2023) GPU optimized simulation design and development, modular robot modeling and control, and matrix-optimized magnet interaction approximation.
20. **Matthew E. Modi** (2022) Modular robotic hardware assembly and testing.

19. **Andrew Song** (2021-2022) Modular robotics simulation development, and robot assembly.
18. **Jiahao Wu** (2021) Modular robotic hardware design, prototyping, and testing.
17. **Priya Patel** (2021) Modular robotic hardware re-design and test protocol creation.
16. **Robert T. Kasumi** (2022) Modular robotic hardware assembly and testing.
15. **David Yi** (2021) Modular robotic hardware assembly and testing.
14. **Nihar N. Garg** (2021) Modular robotic hardware assembly and testing.
13. **Siddharth Bhutoria** (2021) GPU optimized simulation design and development.
12. **Evan H. Tong** (2021) Modular robotics simulation development and optimization.
11. **Omer Mustel** (2021-2022) GPU optimized simulation design and development, modular robot modeling and control.
10. **Yan-Song Chen** (2017-2018) Quadcopter navigation and control.
9. **Adrian J. Lasrado** (2017-2018) Quadcopter hardware and manufacturing.
8. **Robert Kwiatkowski** (2017) Object detection and tracking.
7. **Edith O.A. Comas** (2017-2018) Quadcopter simulation and environment modeling.
6. **Zixi Huang** (2018) End-to-end deep learning quadcopter control.
5. **Xiaotian Hu** (2018) Quadcopter simulator development and deep learning.
4. **Zhiyao Xiong** (2018) Quadcopter AI-Pilot data collection automation.
3. **Tomer Aharoni** (2018) Quadcopter pilot and quadcopter hardware.
2. **Tzu-Chan Chuang** (2018) Deep learning object detection and tracking.
1. **Richard Kennedy** (2016-2017) Quadcopter hardware and design.

## **WORK EXPERIENCE**

---

**Columbia University: Creative Machines Lab** 2019-2020

*Research Staff*

Developed a novel modular robot attachment/detachment mechanism, proposal conceptualization and prototype rendering, conducted research and published "Visual design intuition: predicting dynamic properties of beams from raw cross-section images" publication.

**Goldman Sachs** 2016

*Summer Analyst*

Migrated and deployed a mortgage trading desktop application relevant to multiple trading desks as a web application. Full stack web development using Java and JavaScript.

**InterCard AG** 2013

*Computer Systems Engineer*

Developed monitoring and maintenance processes, and developed an SNMP system monitoring solution to improve service availability. Extended and maintained network infrastructure over two office locations using fiber optic cables to increase network bandwidth.

## **VOLUNTEERING / OUTREACH**

---

- B+STEAM Science Fair: introduced girls at the Brearley school to drone technology and taught them how to pilot a quad-copter in a simulator.
- Columbia Makerspace Super User (since 2018): educated and expanded the Columbia maker community.
- Makerfaire New York 2018: taught soldering to children.

## **SKILLS**

---

<i>Languages</i>	English (Fluent), German (Native), French (Conversational)
<i>Code</i>	Python, PyTorch, PyBullet, C, C++, Matlab, Java, JavaScript, R
<i>CAD</i>	Fusion360, Altair Inspire, openSCAD, FreeCAD, nTop
<i>Tools</i>	3D-printing, laser cutting, water-jetting, CNC-routing, soldering