CURRICULUM VITAE

A. GENERAL

1. **Name:** Filippo Menolascina
2. **School:** School of Engineering
3. **College:** College of Science and Engineering
4. **University:** University of Edinburgh
5. **Career since graduation:**

08/2020 – present	*Reader* at the **University of Edinburgh,** Edinburgh (UK)
08/2020 – present	*Managing Director* at **Noumena Capital Ltd.** (Venture Capital consulting company), Edinburgh (UK)
06/2020 – present	*Strategy and Finance Advisor* at **Dupla Helica** (Biotech startup), Edinburgh (UK)
11/2020– present	*Chief Financial Officer* at **GenCirq, Inc.** (Synthetic Biology startup), San Diego (USA)
03/2020 – present	*Founder* at **OGI Bio** (Startup specialising in microbioreactors), Edinburgh (UK)
09/2019 – present	*Board Observer* at **MiAlgae** (Biotech startup), Edinburgh (UK)
06/2019 – present	*Scientific Advisor* at **Carbogenics** (Biotech startup), Edinburgh (UK)
06/2019 – present	*Scientific Advisor* at **Delfin Health** (Digital health startup), London (UK)
04/2019 – present	*Academic in Residence* at **Equity Gap** (Venture Capital firm), Business Angel Syndicate, Edinburgh (UK)
05/2015 – 7/2020	*Chancellor's Fellow* at the **University of Edinburgh,** Edinburgh (UK)
01/2018 – 04/2020	Co-*Director* of **Edinburgh Genome Foundry,** Edinburgh (UK)
01/2012 – 08/2015	*Postdoctoral Research Associate* at **Massachusetts Institute of Technology,** Cambridge, MA (USA)
06/2013 – 05/2015	*Visiting Postdoctoral Research Associate* at **The Broad Institute of Harvard and MIT,** *Cambridge, MA (USA)*
05/2012 – 12/2017	*Chief Scientific Officer* (Executive Director role) at **Oliba SrL,** Rome (IT)

6. **University education**:

08/2018 – 12/2020	*Executive Master in Business Administration (MBA)* at **The University of Edinburgh,** *Edinburgh (UK)* Class: *First*
11/2008 – 10/2011	*PhD in Computational Biology and Bioinformatics* at **University of Naples,** Naples (IT) Class: *First*
09/2006 – 07/2008	*Laurea Specialistica in Ingegneria Informatica* at **Polytechnic of Bari,** Bari (IT) Class: *First*
09/2003 – 07/2006	*Laurea Triennale in Ingegneria Informatica* at **Polytechnic of Bari,** Bari (IT) Class: *First*

Papers

1. Alexander Shao , Zeyu Lu , Harri Savilahti , **Filippo Menolascina** , Neil Dalchau , Lei Wang. A systematic approach to inserting split inteins for Boolean logic gate engineering and basal activity reduction. ***Nature Communications*** (In press)
2. Bandiera, L., Gomez-Cabeza, D., Gilman, J., Balsa-Canto, E., & **Menolascina, F**. (2020). Optimally Designed Model Selection for Synthetic Biology. ***ACS Synthetic Biology***, *9*(11), 3134-3144.
3. Yawata, Y., Carrara, F., **Menolascina, F.**, & Stocker, R. (2020). Constrained optimal foraging by marine bacterioplankton on particulate organic matter. ***Proceedings of the National Academy of Sciences***, *117*(41), 25571-25579.
4. *Nathan Hillson, Mark Caddick, Yizhi Cai, Jose A Carrasco, Matthew Wook Chang, Natalie C Curach, David J Bell, Rosalind Le Feuvre, Douglas C Friedman, Xiongfei Fu, Nicholas D Gold, Markus J Herrgård, Maciej B Holowko, James R Johnson, Richard A Johnson, Jay D Keasling, Richard I Kitney, Akihiko Kondo, Chenli Liu, Vincent JJ Martin, **Filippo Menolascina**, Chiaki Ogino, Nicola J Patron, Marilene Pavan, Chueh Loo Poh, Isak S Pretorius, Susan J Rosser, Nigel S Scrutton, Marko Storch, Hille Tekotte, Evelyn Travnik, Claudia E Vickers, Wen Shan Yew, Yingjin Yuan, Huimin Zhao, Paul S Freemont. *Building a global alliance of* biofoundries. ***Nature Communications*** 10 (1), 2040 (2019)
5. *Kang Soo Lee, Márton Palatinszky, Fátima C Pereira, Jen Nguyen, Vicente I Fernandez, Anna J Mueller, **Filippo Menolascina**, Holger Daims, David Berry, Michael Wagner, Roman Stocker. An automated Raman-based platform for the sorting of live cells by functional properties. ***Nature Microbiology***, 4, 1035–1048 (2019)
6. **Filippo Menolascina**, Roberto Rusconi, Vicente I. Fernandez, Steven P. Smriga, Zahra Aminzare, Eduardo D. Sontag, Roman Stocker. *Mathematical modeling and logarithmic sensing regime identification in bacterial aerotaxis*. ***Nature Systems Biology & Applications*** (3), 16036 (2016)
7. ^*Kwangmin Son, **Filippo Menolascina** and Roman Stocker. Speed-dependent chemotactic precision in marine bacteria. ***Proceedings of the National Academy of Sciences*** 113 (31), 86248629. (2014)
8. ^***Filippo Menolascina**, Gianfranco Fiore, Emanuele Orabona, Luca De Stefano, Mike Ferry, Jeff Hasty, Mario di Bernardo, Diego di Bernardo. In-vivo real time control of a synthetic gene regulatory network. ***PLoS Comput. Biol***. 10(5): e1003625. (2014)
9. ^Yutaka Yawata, Otto X Cordero, **Filippo Menolascina**, Jan-Hendrik Hehemann, Martin F. Polz, Roman Stocker. Competition-dispersal trade-off ecologically differentiates recently speciated marine bacterioplankton populations. ***Proceedings of the National Academy of Sciences***, 111 (15) 5622-5627 (2014)
10. Son, K., **Menolascina, F**., & Stocker, R. (2016). Speed-dependent chemotactic precision in marine bacteria. ***Proceedings of the National Academy of Sciences***, *113*(31), 8624-8629.

Research programme agreed with Prof. Bevilacqua

Together with my host I designed a set of 10 seminars that leverage on my research experience in biological engineering to support Prof. Bevilacqua's teaching activity in the course "Advanced Bioinformatics". In particular, I plan to introduce the students to the field of "Synthetic Biology", a field born in the early 2000's, where scientists and engineers work together to "re-program" cells to perform valuable tasks; such cells practically become "living robots".

Synthetic Biology is making waves around the world: from re-training immune system cells to recognize and kill cancer cells (CAR-T cells), to re-engineering pancreas cells to reconstitute the control loop that keeps diabetic patients away from hyper-glycemia, the clinical successes of Synthetic Biology are accumulating rapidly. Crucially, while engineering is key to re-design biological systems, engineering students are rarely enticed to engage with Synthetic Biology, thus hampering the disruptive potential of the field and the pace at which society benefits from engineering biology.

In my seminars, targeted at 1st year Master students, I will use concepts from systems theory, systems biology, synthetic biology and control engineering to show how biological systems can be modelled, identified and controlled, in real time. To this end I propose the following schedule of seminars. Given the issues connected to the COVID pandemic, I am conservatively proposing to hold these seminars on-line. Should the opportunity arise to deliver them in person, I will seek to plan for it with my host.

Date	Title	Description
13/9/21	Cells as dynamical systems	Introduction to the mathematical models used to approximate biochemical processes.
20/9/21	Genetic circuits and devices	In this seminar we will establish the parallelism between electrical and genetic circuits. We will also use electrical circuits theory to show how "genetic devices" can be built from genetic circuits.
27/9/21	Biodesign Automation: VHDL for cells	In this seminar we will see how principles form Electronic Design Automation (EDA) can be used to automatically design genetic circuits and "re-program" cells.
11/10/21	System identification for cells: Optimal Experimental Design	Having introduced the models for biological processes in the cell, in this seminar we will analyse how such models can be "calibrated" (i.e. parameters identified) using maximally informative experiments.
18/10/21	Dynamical properties of genetic devices	In this seminar we will go over oscillations, bistability and other fundamental properties of gene circuits, bringing up

		their physiological relevance (e.g. establishing memory units in cells).
25/10/21	Bifurcation theory for systems and synthetic biology	This seminar will build on the previous one to show how bifurcation theory and continuation analysis can be used to identify the emergence of dynamical properties in biological systems and design new ones with desired characteristics.
8/11/21	Feedback loops and endogenous gene expression control	In this seminar we will examine the dynamical properties and performance of control systems that cells use to keep gene expression under control.
15/11/21	Exogenous control of gene expression	In this seminar we will consider 3 recent papers that demonstrated how real-time control can be used to steer gene expression using microscopy and microfluidics.
22/11/21	Genetic PIDs	In this seminar we will design and analyze the genetic equivalent of a PID controller.
6/12/21	Population-distributed PIDs	In this final seminar we will examine how genetic controllers can be split among cells in a population to relieve metabolic burden.