curriculum vitæ of
Caio Fonseca

Computer Science PhD Student · Electrical Engineer
Biophysics/Bioengineering · Computational Biology/Neuroscience · Molecular Communications & Information Theory

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Education

09/2019 – present **Ph.D.** in **Computer Science and Mathematics** — Waterford Institute of Technology, Ireland

Computer Science Ph.D. Student specializing in Molecular Communications for the treatment of brain pathologies such as Glioblastomas, at the Walton Institute for Information and Communication Systems Science - Waterford Institute of Technology, working within the EU-H2020-FET Gladiator Project, a Research that has the objective to treat and diagnose **Glioblastomas Multiforme** via externally autonomous devices implantable in the brain.

11/2012 – 12/2018 **B.Sc.** in **Electrical Engineering** - concentration in Power Engineering — Federal University of Campina Grande - UFCG, Brazil

08/2014 – 05/2015 **Exchange Program** in **Electrical Engineering** — Western New England University, USA

Experience

2022 **Reviewer** — IEEE Journal on Selected Areas in Communications - JSAC

Reviewer of papers for the IEEE JSAC.

09/2019 – 12/2022 **PhD Researcher** — FET-Open Gladiator Project

PhD Researcher at the EU-H2020-FET Gladiator Project. Research tasks: **End-to-End Molecular Communication modeling and simulations for the treatment of Glioblastoma Multiforme**.

11/2022 – 12/2022 **Lecturer** in Computer Science — South East Technological University, Ireland

Lecturer of Artificial Intelligence and Cryptography modules.

10/2021 – 11/2021 **Visiting Scholar** - Biological Microsystems Lab. — Rochester Institute of Technology - RIT, USA

Visiting Scholar at the Kate Gleason College of Engineering, RIT. Research titled: **Computational modeling and experimental validation of diffusion coefficients within structurally anisotropic biopolymer matrices**

11/2020 – 12/2020 **Lecturer** in Computer Science — Waterford Institute of Technology, Ireland

Lecturer of Programming Essentials and Data Structure online modules.

05/2015 – 08/2015 **Visiting Student Researcher** in Electrical Engineering — University of California, Los Angeles - UCLA, USA

Undergraduate research during the during the summer in the NanoCAD Lab.

01/2017 – 04/2014 **Undergraduate Researcher** — Edmond & Lily Safra International Institute of Neurosciences, Brazil

Research on Brain-machine Interfaces and EEG signal processing.

2016 – 2017 **Lecture Assistant** — Federal University of Campina Grande - UFCG, Brazil

Lecture assistant of the Electromagnetics course.

04/2013 – 06/2013 **Lecture Assistant** — Federal University of Campina Grande - UFCG, Brazil

Lecture assistant of the Mechanics/General Physics I course.

09/2018 – 12/2018 **Electrical Engineering Intern** ENGESELT - Engenharia e Serviçoes Elétricos LTDA, Brazil

Working on electrical energy distribution and transmission projects.

Publications

Conference and Journal Publications

Published **Papers**

1. Celina Paula, Camille Reategui, Bruna Fonseca, **Caio Fonseca**, Luana da Silva, Edgard Morya, Fabricio Brasil. **High-Frequency EEG Variations in Children with Autism Spectrum Disorder during Human Faces Visualization**. In *Brain Computer Interface Systems for Neurorobotics: Methods and Applications, Biomed Research International, 2017.*

2. **Caio Fonseca**, Michael Barros, Andreani Odysseos, Sasitharan Balasubramaniam. **Predator-Prey Adaptive Control for Exosome-based Molecular Communications Glioblastoma Treatment**. In *IEEE International Conference on Communications, 2021 - https://doi.org/10.1109/ICC42927.2021.9500631.*

3. Bruna Fonseca,**Caio Fonseca**, Michael Barros, Mark White, Vinay Abhyankar, David A. Borkholder, Sasitharan Balasubramaniam. **Ultrasound-based Control of Micro-Bubbles for Exosome Delivery in Treating COVID-19 Lung Damage**. In *COVI-COM Workshop - IEEE International Conference on Communications, 2021 - https://doi.org/10.1109/ICCWorkshops50388.2021.9473613.*

4. **Caio Fonseca**, Michael Barros, Andreani Odysseos, Srivatsan Kidambi, Sasitharan Balasubramaniam. **Quasi-Spherical Absorbing Receiver Model of Glioblastoma Cells For Exosome-based Molecular Communications**. In *9th ACM International Conference on Nanoscale Computing and Communication, 2022.*

Posters, Conferences & Certificates

10/2022 **9th ACM International Conference on Nanoscale Computing and Communication, October 5-7, 2022** Barcelona, Spain

Participated in the conference and presented a short paper as first author.

07/2021 **8th ACM International Conference on Nanoscale Computing and Communication Virtual Conference, September 7-9, 2021 - Data Competition**

Participated in the conference and in the **Data Competition** of the conference presenting a poster with the work and results of the competition.

08/2021 **Neural circuit complexity: Neuroscience, Models and Robotics (BrainCosmos) - Lake Como School of Advanced Studies**, 30 August - 3 September, 2021

Participated in the conference in a remote mode.

07/2021 **Cell Modeling workshop 2021**

Participated in the Cell Modeling Workshop given by The National Center for Multiscale Modeling of Biological Systems.

06/2021 **IEEE International Conference on Communications**

Presented Conference and Workshop papers as First author and co-author respectively.

01/2021 **Poster Presentation - University Hospital Waterford** Waterford, Ireland

Presentation Title: Reconstruction of the Brain Extracellular Space - 7th Annual University Hospital Waterford Research Day.

12/2020 **BioDesign Conference**

1st International BioDesign Research Conference.

09/2019 **ACM NanoCom** Dublin, Ireland

6th International Conference on Nanoscale Computing and Communication.

MATLAB Training

MATLAB course with duration of 15 hours.

Deep Learning Course - Python

Duration of 23 hours.

Machine Learning Course - Python

Duration of 40.5 hours.

I Networking Day Campina Grande, Brazil

Conference with talks about Technology, Computer Science and AI.

IV Electrical Engineering Day Campina Grande, Brazil

Electrical Engineering Conference in the Federal University of Campina Grande.

V Electrical Engineering Day Campina Grande, Brazil

Electrical Engineering Conference in the Federal University of Campina Grande.

Skills

Strong knowledge of the programming language `Python` and `MATLAB` for data analysis and simulations. Working knowledge of C/C++ programming languages. Neuron and Cellblender are softwares that I use frequently in my research work. I also have working knowledge of AutoCAD, Multisim, Simulink and Graphical user-interface development using Python. Comfortable in using Linux, MacOS and Windows based operating systems. Comfortable in using online version control repositories such as Bitbucket and Github.

Honors

2011 1st Place in the High School Olympics Alfredo Dantas High School

First place in the Mathematics, Physics and Chemistry olympics of Alfredo Dantas High school

2014 Named to the Dean's List Western New England University, USA

Students with a GPA higher than 3.3

Service To The Scientific Community

Organiser ACM Nanocom Dublin, Ireland

Assistance in the organisation throughout the days of the conference.