Gabriel Agostini

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EDUCATION

Columbia University, Columbia College 2021 - 2022
Bachelor of Arts in Urban Studies

Columbia University, School of Engineering and Applied Sciences 2017 - 2021
Bachelor of Science in Applied Mathematics
GPA: 4.08/4.0

Budapest Semesters in Mathematics Spring 2020
Study Abroad

PUBLICATIONS

Gabriel Agostini, Yushan Zhang, Debra Laefer. *A Category-Theory Approach to Construction Ontologies in Subsurface Mass Transit*. Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XLVI-4/W4-2021, 125–130, 2021. doi.org/10.5194/isprs-archives-XLVI-4-W4-2021-125-2021

PRESENTATIONS

A Category-Theory Approach to Construction Ontologies in Subsurface Mass Transit October 2021
3D GeoInfo Conference

Operationalizing Equity in the San Francisco Student School Assignment, video link August 2021
Stanford Data Science for Social Good

Knot Surgery and Integer Characterizing Slopes, video link August 2019
Columbia University Mathematics Department

RESEARCH EXPERIENCE

Stanford & San Francisco Unified School District Partnership June 2021 - Present
Stanford University | Advisor: ***Prof. Irene Lo***

- Design an algorithm to ensure equal access to education for underserved students in San Francisco
- Incorporate the work with the current student assignment process, which uses deferred acceptance
- Identify geographical proxies (red-lining history, median income) for education access barriers
- Work alongside policymakers, communicating the decisions and incorporating feedback timely

Centre for Urban Science and Policy May 2020 - Present
TU Delft | Advisor: ***Prof. Trivik Verma***

- Use Open Street Maps street networks data (with OSMNx) to study underlying patterns in urban grids
- Extensively clean and refine street network data
- Develop a methodology to measure the wiring (correlation) of graphlets in street networks
- Produce a dataset with over 15,000 square kilometers of worldwide street networks and their wirings
- Worked independently under prof. Verma's supervision to design a research question

Urban Modelling Group June 2020 - August 2021

Center for Urban Science and Progress, NYU | Advisor: ***Prof. Debra Laefer***

- Explore efficient systems of data organization for asset management in subway systems
- Clean and understand data for over 1,500 items in New York City subway stations
- Build ologs—an innovative Category Theory object—-to represent four subway stations across the world

Columbia Mathematics Research Experience for Undergraduates June 2019 - August 2019

Columbia University | Advisor: ***Prof. Kyle Hayden***

- Used computational software (SnapPea) in Algebraic Topology to study knot invariants
- Contributed to the verification of modern conjectures in Knot Theory such as Baker's conjecture (2018)
- Classified integer slopes for Dehn surgery of non-twist knots with unknotting number 1

TEACHING EXPERIENCE & STEM OUTREACH

Columbia University Mathematics Department, Teaching Assistant Spring 2019, Fall 2019, Summer 2020, Spring 2021, Summer 2021, Fall 2021

- Grade problem sets and hold weekly office hours
- Assisted for Calculus II, Multivariable Calculus, Linear Algebra, and Ordinary Differential Equations

Fênix Pré-Vestibulares, Mathematics Instructor Summer 2018

- Plan and run over 50 hours of lessons and problem sets focused on Brazilian college entrance exams
- Enhanced the outreach of Mathematics education to students from the public school system
- Organized curriculum on basic mathematics, set theory, functions, and trigonometry

LEADERSHIP EXPERIENCE

International Student Advisory Board, Social Media Chair May 2018 - May 2021

Columbia University Multicultural Affairs

- Work with university staff to enhance the experience of undergraduate international students
- Advocate for policies to improve community-building, financial literacy, and intersectional expression
- Managed and created content for the International@Columbia Facebook page
- Selected three times as an orientation leader for the International Student Orientation Program to assist over 150 first-year students in their transition to Columbia

FUNDING AWARDS

Queer in AI Grad Application Financial Aid Fall 2021

Out in STEM and Queer in AI

Stanford Data Science for Social Good Fellowship Summer 2021

Stanford Data Science Institute

Work Exemption Program Summer 2021, Fall 2021

Columbia University Center for Career Education

Tandon Undergraduate Summer Research Program Summer 2020

New York University Tandon School of Engineering

Columbia University Summer Funding Summer 2020, 2021

Columbia University Center for Career Education

HONORS

Summa Cum Laude May 2021
Columbia University School of Engineering and Applied Sciences
Distinction awarded to the top 5% students of the graduating class

Kitüntetéssel March 2020
Budapest Semesters in Mathematics
Highest academic honors, awarded to top-performing students in the program

Core Scholar April 2018
Columbia University Core Curriculum Office
Prize awarded to a creative project—-a game called *Cards Against Sappho*—that reflects the student's engagement with the Columbia University Core Curriculum

Dean's List 2017-2021
Columbia University
Distinction awarded to students who maintain a high GPA every semester

Charles Prescott Davis Scholarship 2017-2022
Columbia University
Competitive merit-based scholarship granted upon admission

Brazilian Mathematics Olympiad Medalist 2011, 2013, 2015, 2016
Brazilian Institute of Pure and Applied Mathematics (IMPA)

RELEVANT COURSEWORK

Mathematics	Real Analysis (A), Measure Theory (A+), Complex Analysis (A+), Partial Differential Equations (A+), Dynamical Systems (A+), Numerical Methods (A+), Linear Algebra (A+), Algebra I and II (A/A+), Topology (current)
Statistics	Probability Theory (A), Stochastic Processes (A+), Statistical Inference (A+), Multivariate Statistics (A)
Network Science	Graph Theory (A+), Spectral Theory of Graphs and Groups (A+), Structure of Complex Networks (A+), Analysis of Networks and Crowds (A)
Machine Learning	Machine Learning (A), Geometric Data Analysis (A)
Social Sciences	Global Urbanism (A), Urban Elsewheres (A), History of the City in Latin America (A) Colonial Cities of the Americas (current)

SKILLS

Programming	Python (matplotlib, seaborn, pandas, scipy, networkx, geopandas, osmnx, sklearn), R
Technology	Git, Microsoft Excel, Social Media, LaTex, ArcGIS, qGIS
Languages	Brazilian Portuguese (native), Italian (advanced), Russian (basic)
Others	Bartending