

Gabriel Agostini

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EDUCATION

Columbia University , Columbia College <i>Bachelor of Arts in Urban Studies</i> GPA: 4.12/4.00	2021 - 2022
Columbia University , School of Engineering and Applied Sciences <i>Bachelor of Science in Applied Mathematics</i> GPA: 4.08/4.00	2017 - 2021

PUBLICATIONS

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- Gabriel Agostini**, Juliana Gonçalves, Trivik Verma. "Identifying Urban Morphology from Street Networks with Graphlet Analysis." *30th Annual Geographical Information Science Research UK (GISRUK)*, Liverpool, United Kingdom. April 1, 2022. doi.org/10.5281/zenodo.6407124
- Gabriel Agostini**, Yushan Zhang, Debra Laefer. "A Category-Theory Approach to Construction Ontologies in Subsurface Mass Transit." *International Archives of Photogrammetry, Remote Sensing, and Spatial Information Sciences*, XLVI-4/W4-2021, 125–130, 2021. doi.org/10.5194/isprs-archives-XLVI-4-W4-2021-125-2021

PRESENTATIONS

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| Identifying Urban Morphology from Street Networks with Graphlet Analysis
<i>Geographical Information Systems Research UK (GISRUK) Conference</i> | April 2022 |
| A Category-Theory Approach to Construction Ontologies in Subsurface Mass Transit
<i>3D GeoInfo Conference</i> | October 2021 |
| Operationalizing Equity in the San Francisco Student School Assignment , video link
<i>Stanford Data Science for Social Good</i> | August 2021 |
| Knot Surgery and Integer Characterizing Slopes , video link
<i>Columbia University Mathematics Department</i> | August 2019 |

RESEARCH EXPERIENCE

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| Centre for Urban Science and Policy
<i>TU Delft</i> Advisor: Prof. Trivik Verma | May 2020 - Present |
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- Use OpenStreetMap street networks data (with OSMNx) to study underlying patterns in urban grids
 - Extensively clean and process network and spatial data in Python
 - Develop a methodology to measure the autocorrelation of graphlets in street networks
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| Stanford & San Francisco Unified School District Partnership
<i>Stanford University</i> Advisor: Prof. Irene Lo | June 2021 - December 2021 |
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- 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

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

Kitüntetés

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

<i>Analysis & Topology</i>	Real Analysis (A), Measure Theory (A+), Complex Analysis (A+), Functional Analysis (curr) ODEs (A+), PDEs (A+), Dynamical Systems (A+), Topology (A+)
<i>Algebra</i>	Linear Algebra (A+), Abstract Algebra I (A), Abstract Algebra II (A+)
<i>Statistics</i>	Probability Theory (A), Stochastic Processes (A+), Time Series Analysis (curr) Statistical Inference (A+), Multivariate Statistics (A), Sample Surveys (curr)
<i>Network Science</i>	Graph Theory (A+), Spectral Theory of Graphs and Groups (A+), Structure of Complex Networks (A+), Analysis of Networks and Crowds (A)
<i>Machine Learning</i>	Machine Learning (A), Geometric Data Analysis (A)
<i>Social Sciences</i>	Global Urbanism (A), Urban Elsewheres (A), History of the City in Latin America (A) Colonial Cities of the Americas (A), Postwar Fiction and Architecture (curr)

SKILLS

<i>Programming</i>	Python (matplotlib, seaborn, scipy, pysal, networkx, geopandas, osmnx, sklearn), R
<i>Technology</i>	Git, Microsoft Excel, Social Media, LaTeX, ArcGIS, QGIS
<i>Languages</i>	Brazilian Portuguese (native), Italian (advanced), Russian (basic)
<i>Others</i>	Bartending