

Ivan Martino

Teaching Portfolio

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Teaching, mentoring and supervising are relevant parts of my academic activity. I have taught in several languages (English, Swedish, French, and Italian) at University of Catania (2008-2009), at Stockholm University (2009-2014), at University of Fribourg (2014-2016), at Northeastern University (2016-2018) and at KTH (since 2019). My teaching portfolio has a large spectrum of courses at any academic level.

My experience includes supervising more than fifteen undergraduate and graduate students for bachelor, master and research projects. Many of them are now doctoral students: Jai Aslam (NC State), Alessio Borzi (Warkick), Alon Duvall (UC-San Diego), Timothy Jackman (Boston University), Victor Lisinski (University of Oxford), and Kevin Su (UC Riverside).

I have also been very active in organizing research schools for graduate students, research periods for undergraduates and several dissemination talks for undergraduate and high school students. For instance, I would like to highlight the *Research Experience for Undergraduates* at Northeastern University.

Teaching Portfolio

At Kungliga Tekniska Högskolan (KTH)

Spring 2019 **Discrete Mathematics – SF1610 TCOMK (Undergraduate)**, *Instructor*, Undergraduate course for engineers.

Spring 2019 **Diploma Thesis (Master level)**, *Advisor of Alessio Borzi*.

At Northeastern University

Autumn 2018 **Experiential Ed Directed Study - MATH 4996 (Master level)**, *Advisor of Zheyang Yu*.

Autumn 2018 **Introduction to mathematical reasoning – MATH 1365**, *Instructor*, Undergraduate course for mathematicians; Three hours per week and weekly homework corrections.

Summer 2018 **Research Experience for Undergraduates**, *Advisor of Walker Miller-Breetz, Benjamin Bonenfant, Zheyang Yu, Kevin Su, Christina Nguyen, Noah Lichtblau, Felipe Castellano-Macias, Alon Duvall, Timothy Jackman*.

Aut 2017 **Math Club**, *Faculty Advisor for the Mathematical Club*.

Spring 2017 **Jr/Sr Honors Project – MATH 4970-38489**, *Advisor of Jai Aslam*.

Autumn 2016 **Undergraduate research – Math 4020**, *Math Department consultant*, Mathematics Capstone course, Undergraduate research – Math 4020.

Autumn 2016 **Introduction to Mathematical Reasoning – MATH 1365**, *Instructor*, Undergraduate course for mathematicians; Three hours per week and weekly homework corrections.

At University of Fribourg

Spring 2016 **Algebra and Geometry II**, *Teaching Assistant*, Undergraduate course for mathematicians, Two hours per week and weekly homework corrections.

- Jan 24-29, 2016 **SM'ART - Borel Seminar 2016**, *Instructor, Lesson in Matroid Theory and Commutative Algebra*, Seminar on Matroids in Algebra, Repr. theory and Topology, Les Diablerets.
- Autumn 2015 **Algebra and Geometry I**, *Teaching Assistant*, Undergraduate course for mathematicians, Two hours per week and weekly homework corrections.
- Spring 2015 **The cohomology of toric varieties using shellability**, *Instructor*, Graduate minicourse in connection with the Thematic Semester in Topology.
- Spring 2015 **Resolution of singularities**, *Instructor*, Graduate minicourse in connection with the Thematic Semester in Topology.
- Spring 2015 **Introduction to toric varieties**, *Instructor*, Graduate minicourse in connection with the Thematic Semester in Topology.
- Spring 2015 **Combinatorial methods in topology**, *Teaching Assistant*, Master/Graduate course for mathematicians, Two hours per week and weekly homework corrections.
- Autumn 2014 **Mathematical methods in computer science (MMI)**, *Teaching Assistant*, Master course for computer-scientists, Two hours per week and weekly homework corrections.
- At Stockholm University**
- Mar-May 2014 **Advanced Seminar - Extraseminars**, *Instructor*, Undergraduate course for the class of science, Two hours per week and weekly homework corrections.
- Jan-May 2014 **Advanced Seminar - Extraseminars**, *Instructor*, Undergraduate course for the class of science, Two hours per week and weekly homework corrections.
- Oct-Dec 2014 **Advanced Seminar - Extraseminars**, *Instructor*, Undergraduate course for the class of science, Two hours per week and weekly homework corrections.
- 2013-2014 **Kappa competition 2013**, *Mathematical Competition*, Sweden, 75 hours.
- Jan-May 2013 **Matematik I**, *Teaching Assistant - Seminarisgruppen*, Undergraduate course for the class of science, Algebra, Linear Algebra and Analysis, 48 hours.
- Jan-May 2013 **Advanced Seminar - Extraseminars**, *Instructor*, Undergraduate course for the class of science, Two hours per week and weekly homework corrections.
- Mar-May 2012 **Advanced Seminar - Extraseminars**, *Instructor*, Undergraduate course for the class of science, Two hours per week and weekly homework corrections.
- Jan-May 2012 **Advanced Seminar - Extraseminars**, *Instructor*, Undergraduate course for the class of science, Two hours per week and weekly homework corrections.
- Jan-May 2012 **Matematik I**, *Tutoring -Handledning*, Undergraduate course for the class of science, Algebra, Linear Algebra and Analysis, 40 hours.
- Sept-Dec 2011 **Matematik I**, *Teaching Assistant - Räkneövning*, Undergraduate course for the class of science, Algebra, Linear Algebra and Analysis, one hour per week.
- Oct-Dec 2011 **Matematik I**, *Tutoring - Seminarisgruppen*, Undergraduate course for the class of science, Algebra, Linear Algebra and Analysis, 48 hours.
- Oct-Dec 2011 **Advanced Seminar - Extraseminars**, *Instructor*, Undergraduate course for the class of science, Two hours per week and weekly homework corrections.
- Jan-May 2011 **Matematik I**, *Tutoring -Handledning*, Undergraduate course for the class of science, Algebra, Linear Algebra and Analysis, 40 hours.

- Oct-Dec 2010 **Matematik I, Tutoring - Handledning**, Undergraduate course for the class of science, Algebra, Linear Algebra and Analysis, 40 hours.
- Oct-Dec 2010 **Optimization, Instructor**, Master course, 8 hours.
- Oct-Dec 2010 **Advanced Seminar - Extraseminars, Instructor**, Undergraduate course for the class of science, Two hours per week and weekly homework corrections.

At University of Catania

- 2008-2009 **Geometria, Teaching Assistant**, Undergraduate course for mathematicians, 150 hours.

Experience as Supervisor and Mentor

For sake of completeness, some information given in other documents are repeated also here.

During 2012, I have been thesis advisor of three master students under the the Swedish International Development Cooperation Agency (SIDA) project for Mathematics: Manishimwe Alexis, Janvier Ndahimana Rukundo , and Jean Harerimana. While in Stockholm, I have also supervised Niklas Hedberg for the Bachelor thesis.

In Autumn 2017, I was *Math Department consultant* and, later, *supervisor* of Jai Aslam, accepted in September 2018 for graduate study at North Carolina State University. Finally, I have organized a *Research Experience for Undergraduates*, with Emanuele Macrì and I had the opportunity to mentor and supervise several undergraduate students in their first step in the research world.

- Feb 2019 **Diploma Thesis – Alessio Borzì**, KTH.
Thesis title: 'Independencies and Tutte for D -matroids'.
- Dec 2018 **Experiential Educational Direct Study – Zheyang Yu**, Northeastern University.
Thesis title: 'Introduction to Matroid Theory'.
- Sept 2018 **REU Student – Alon Duvall**, Northeastern University.
Together with Brian Hepler;
- Sept 2018 **REU Student – Timothy Jackman**, Northeastern University.
Together with Whitney Drazen;
- Sept 2018 **REU Student – Walker Miller-Breetz**, Northeastern University.
Together with Rahul Singh;
- Sept 2018 **REU Student – Benjamin Bonenfant**, Northeastern University.
Together with Reuven Hodges;
- Sept 2018 **REU Student – Christina Nguyen**, Northeastern University.
Together with Whitney Drazen;
- July 2018 **REU Student – Zheyang Yu**, Northeastern University.
Together with Celine Bonandrini;
- July 2018 **REU Student – Kevin Su**, Northeastern University.
Together with Jonier Antunes;
- June 2018 **REU Student – Noah Lichtblau**, Northeastern University.
Together with Mikhail Mironov;
- June 2018 **REU Student – Felipe Castellano-Macias**, Northeastern University.
Together with Alex Sorokin;
- May 2017 **BSc thesis advisor of Jai Aslam**, Northeastern University.
Thesis title: 'Group actions on Knots'.

- June 2016 **MSc thesis advisor of Jean Harerimana**, Stockholm University, National University of Rwanda and Linköping University, together with Augusto Gerolin.
Thesis title: 'Some mathematical models for Population Growth and Crowd Motion'.
- Nov 2013 **BSc thesis advisor of Niklas Hedberg**, Stockholm University.
Thesis title: 'Derivation of Runge-Kutta order conditions'.
- Oct 2013 **MSc thesis advisor of Manishimwe Alexis**, Stockholm University, National University of Rwanda and Linköping University, together with Augusto Gerolin.
Thesis title: 'Hausdorff's measure and the Isoperimetric problem'.
- Oct 2013 **MSc thesis advisor of Janvier Ndahimana Rukundo**, Stockholm U, National University of Rwanda and Linköping University, together with Augusto Gerolin.
Thesis title: 'Genetic Algorithms and their applications'.

University Pedagogical Education

Teacher training program (2017-2018). Prof. Sandy Blank and Prof. Lee Lee-Peng are in charge of the Teacher training program at Northeastern University. The goal is training the new graduate students for their first TA or Instructor duty. I was part of the *pedagogical committee*: the graduate students gave mini-lectures and received feedbacks and suggestions from us.

Symposia, conferences, and workshops

I have organized several international research events for undergraduate and graduate students.

- Apr - Sept, **REU - Independent Research Experience for Undergraduates**, *Organizer - 2018 together with Emanuele Macrì (Northeastern University), USA.*
Funded by NSF, as DMS-1645877.
- Feb 21 – 23, **Lectures Series in Mathematics – Aaron Lauda**, *Organizer - together with 2018 Emanuele Macrì (Northeastern University), USA.*
Funded by NSF, as DMS-1645877.
- Sept 11-15, **Matroids in Boston 2017**, *Organizer of a thematic week on Matroid Theory, 2017 Northeastern University, USA.*
There were research talks, together with graduate lectures and graduate research seminars.
- May 31 - Jun 3, 2017 **ET'nA 2017 - Encounter in Topology 'n Algebra**, *Organizer - together with Alex Suciu - of a workshop and a summer school, Scuola Superiore di Catania, Italy.*
One-day Summer School (May 31) and a mentoring day (June 4-th).

Experience of popular science activities

π -day. I was invited to talk on March 14, 2019 at the π -day organized by Vetenskapens Hus, Stockholm University, KTH, and Stockholm Matematik Centrum. My talk was titled: *Rock Scissor Paper Spock Lizard* and aimed to understand the commutative and associative properties.

Math dissemination. Recently, I prepared a series of dissemination talks addressing STEM students. It follows a list of them:

- Apr 12, 2018, Independence day: Matroids, Boston, MA.
- Nov 2, 2017, Groups, Boston, MA.
- Oct 19, 2017, Semigroups, Boston, MA.
- Oct 5, 2017, Determinant, Boston, MA.
- Sept 21, 2017, Counting lattice points, Boston, MA.
- Sept 7, 2017, The coin problem, Boston, MA.
- April 11, 2017, La bellezza delle carte (in italian) - Italian Club of Northeastern U, Boston, MA;
- March 2, 2017, The Game SET, Boston, MA.