

Curriculum Vitae – September, 2019

Marcello Carioni

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Personal data

Name: Marcello Carioni
Date of birth: December 13, 1987
Place of birth: Crema (CR), Italy
Citizenship: Italian

Academic employments

September 2017–March 2020

Postdoctoral researcher
Institution: University of Graz
Supervisor: Prof. Kristian Bredies

February 2017–August 2017

Postdoctoral researcher
Institution: University of Würzburg
Supervisor: Prof. Anja Schlömerkemper

Education

April 2013–July 2017

PhD student in Mathematics
Institution: Max-Planck Institute for Mathematics in the Science, Leipzig
Supervisor: Prof. Bernd Kirchheim

October 2009–April 2012

MsC in Mathematics
Institution: University of Parma, Italy
Final Grade: 110/110 with honour
Thesis: *Quasi-BV Structure of Entropy Solutions of Multidimensional Scalar Conservation Laws*
Advisor: Prof. Gianluca Crippa

October 2006–December 2009

BA in Mathematics
Institution: University of Parma, Italy
Final Grade: 110/110 with honour
Thesis: *Scalar Conservation Laws and Kruzkov Theorem*
Advisor: Prof. Gianluca Crippa

Research interests

Calculus of Variations and Optimization, Image processing, Inverse Problem, Machine learning, Hamilton–Jacobi Equations

Publications and preprints

1. *On the Extremal Points of the Benamou-Brenier Energy*, joint work with Kristian Bredies, Silvio Fanzon and Francisco Romero, 2019. Submitted (<https://arxiv.org/abs/1811.09857>)
2. *External Forces in the Continuum Limit of Discrete Systems with Non-convex Interaction Potentials: Compactness for a Γ -development*, joint work with Julian Fischer and Anja Schlömerkemper, 2018. Submitted (<https://arxiv.org/abs/1811.09857>)
3. *Sinkhorn AutoEncoders*, joint work with Giorgio Patrini, Patrick Forré, Samarth Bhargava, Max Welling, Rianne van den Berg, Tim Genewein, Frank Nielsen. UAI 2019 (<https://arxiv.org/abs/1810.01118>).
4. *Sparsity of Solutions for Variational Inverse Problems with Finite-Dimensional Data*, joint work with Kristian Bredies, 2018. Submitted (<https://arxiv.org/abs/1809.05045>)
5. *On Different Notions of Calibrations for Minimal Partitions and Minimal Networks in \mathbb{R}^2* , joint work with Alessandra Pluda. Adv. in Calc. Var, 2019 (<https://arxiv.org/abs/1805.11397>)
6. *Long Time Behaviour for the Reinitialization of the Distance Function*, 2017. Submitted (<https://arxiv.org/abs/1711.01956>)
7. *Calibrations for Minimal Networks in a Covering Space Setting*, joint work with Alessandra Pluda. ESAIM: Control, Optimisation and Calculus of Variations, 2019 (<https://arxiv.org/abs/1707.01448>)
8. *A Discrete Coarea-type Formula for the Mumford–Shah Functional in Dimension One*. Journal of Convex Analysis 25, No. 4, 1197–1221, 2018 (<https://arxiv.org/abs/1610.01846>)
9. *Loss Factorization, Weakly Supervised Learning and Label Noise Robustness*, joint work with Giorgio Patrini, Frank Nielsen and Richard Nock. ICML 2016 (<https://arxiv.org/abs/1602.02450>)

Proceedings and Patents

1. *Calibrations in Families for Minimal Networks*. Joint work with Alessandra Pluda. Proceeding at 89th GAMM annual meeting, 2018
2. *Self Organizing Representations: Unsupervised and Semi-supervised Learning with Wasserstein Distances*. Patent submitted for evaluation, 2018

Talks and posters

- **Talk:** *Calibration method for the Mumford–Shah Functional*, Max–Planck Institute, Leipzig, May 2014
- **Poster:** *Calibration for the Mumford–Shah Functional*, Max–Planck Institute, Leipzig, April

2015

- **Talk:** *Existence of Calibration for the Mumford–Shah Functional in One Dimension*, University of Pisa, April 2016
- **Talk:** *Calibration for the Mumford–Shah Functional in One Dimension*, Thematic period on ”Calculus of Variations, Optimal Transportation, and Geometric Measure Theory: from Theory to Applications”, Lyon, July 2016
- **Talk:** *A Discrete Coarea-type Formula for the Mumford–Shah Functional in Dimension One*, AG Seminar, Max–Planck Institute, Leipzig, November 2016
- **Talk:** *Calibration for the Steiner Problem in a Covering Space Setting*, XXVII Convegno Nazionale di Calcolo delle Variazioni, Levico Terme, February 2017
- **Talk:** *A Discrete Coarea-type Formula for the Mumford–Shah Functional in Dimension One*, Karl-Franzens-Universität Graz, February 2017
- **Talk:** *A Discrete Coarea-type Formula for the Mumford–Shah Functional in Dimension One*, University of Parma, May 2017
- **Talk:** *A Discrete Coarea-type Formula for the Mumford–Shah Functional in Dimension One*, Oberseminar, Universität Regensburg, May 2017
- **Talk:** *A Discrete Coarea-type Formula for the Mumford–Shah Functional in Dimension One*, Oberseminar, Universität Würzburg, May 2017
- **Talk:** *On Minimal Partition Problems*, Research seminar, Universität Graz, November 2017
- **Talk:** *Viscosity Solution for Hamilton-Jacobi Equations*, Research seminar, Universität Regensburg, February 2018
- **Talk:** *Calibrations for Minimal Networks in a Covering Space Setting*, Oberseminar, IST Wien, February 2018
- **Talk:** *Sparsity of Solutions for Variational Inverse Problems with Finite Dimensional Data*, Oberseminar, Technische Universität Munich, June 2018
- **Poster:** *Sparsity of Solutions for Variational Inverse Problems with Finite Dimensional Data*, European Women in Mathematics General Meeting, September 2018
- **Talk:** *Sparsity of Solutions for Variational Inverse Problems with Finite Dimensional Data*, University of Zagreb, October 2018
- **Talk:** *Sparsity of Solutions for Variational Inverse Problems with Finite Dimensional Data*, Topics in Nonlinear Analysis: Calculus of Variations and PDE, University of Lisbon, October 2018
- **Talk:** *Sparsity of Solutions for Variational Inverse Problems with Finite Dimensional Data*, GAMM 2019, TU Wien, February 2019
- **Talk:** *Sparsity of Solutions for Variational Inverse Problems with Finite Dimensional Data*, SPARS 2019, Toulouse, June 2019

Additional research stays (not related to talks)

- *Ecole Polytechnique*, 13 – 18 November 2017. Invited by Frank Nielsen
- *University of Verona*, 20 – 23 November 2017. Invited by Annalisa Massaccesi

Workshops and schools attended

- *Intensive Research Month on Hyperbolic Conservation Laws and Fluid Dynamics*, Università degli studi di Parma, 1–28 February, 2010
- *Nonlinear Hyperbolic PDEs, Dispersive and Transport Equations*, Sissa (Trieste), May 16 –July

22, 2011

- *14th International Conference on Hyperbolic Problems: Theory, Numerics, Applications*, Università di Padova, 25–29 June, 2012
- *School and Workshop on "Geometric Measure Theory and Optimal Transport"*, ICTP (Trieste), July 15–August 2, 2013
- *Partial Differential Equations and Geometric Measure Theory* Cetraro, June 2–June 7, 2014
- *Summer School on Geometric Measure Theory and Geometric Analysis* University of Basel, 23–27 June 2014, 14–18 July, 2014
- *XXV Convegno Nazionale di Calcolo delle Variazioni*, Levico Terme, 2–6 February, 2015
- *Summer School on Geometric Measure Theory and Calculus of Variations: Theory and Applications*, Institute Fourier, Grenoble, June 22–July 3, 2015
- *Summer School on Nonlinear PDE's and Applications to Image Analysis. A Scientific Tribute to Vicent Caselles*, CRM, Barcelona, 20–24 July, 2015
- *XXVI Convegno Nazionale di Calcolo delle Variazioni*, Levico Terme, 18–22 January, 2016
- *HJ2016: Hamilton–Jacobi Equation: New Trends and Applications*, Rennes, May 30–June 3, 2016
- *Thematic Period on "Calculus of Variations, Optimal Transportation, and Geometric Measure Theory: from Theory to Applications"*, Lyon, 4–15 July, 2016
- *XXVII Convegno Nazionale di Calcolo delle Variazioni*, Levico Terme, 6–10 February, 2017
- *Ninth School in Analysis and Applied Mathematics*, Roma, 5–9 June, 2017
- *Geometric Measure Theory in Verona*, Verona, 11–15 June, 2018
- *European women in Mathematics general meeting*, Graz, 3–7 September, 2018
- *Variational Methods and Optimization in Imaging*, Paris, 4–8 February, 2019
- *GAMM 2019*, Wien, 18–22 February, 2019
- *Material Theories, Statistical Mechanics, and Geometric Analysis: A Conference in Honour of Stephan Luckhaus' 66th Birthday*, Leipzig, 3–6 June, 2019
- *SPARS 2019*, Toulouse, 1–4 July, 2019
- *Optimal Transport and Optimal Patterns*, Edinburgh, 2–5 September, 2019

Teaching

- **Tutorial:** *Image Processing*. Faculty of Mathematics, Universität Graz (summer semester 2018–2019)
- **Lecture:** *Harmonic Analysis*. Faculty of Mathematics, Universität Graz (winter semester 2018–2019) with Robert Beinert
- **Lecture:** *Image Processing*. Faculty of Mathematics, Universität Graz (summer semester 2017–2018)
- **Tutorial:** *Mathematics 2 for Physicists and Engineers*. Faculty of Mathematics, Universität Würzburg (summer semester 2016–2017)
- **Tutorial:** *Ordinary differential equations*. Faculty of Mathematics, University of Leipzig (winter semester 2016–2017)
- **Tutorial:** *Analysis 1*. Faculty of Architecture, University of Parma (2010–2011)

Fellowships

- IMPRS PhD fellowship (2013–2016)
- ADSU fellowship for academic merit (2007–2011)

Languages

Italian: Mother tongue

English: Fluent

Spanish: Fluent

German: Level B2

French: Level A2