Curriculum Vitae

Personal Data

Title	Professor
First name	Giuseppe
Name	Buttazzo
Current position	Full professor in Mathematical Analysis
Current institution(s)/site(s), country	University of Pisa, Italy
Identifiers/ORCID	https://orcid.org/0000-0003-1769-6801

Qualifications and Career

Stages	***Periods and Details***
Degree programme	1972 – 1976, student at University of Pisa and at Scuola Normale Superiore di Pisa, Italy
Doctorate	1976–1980, PhD student at Scuola Normale Superiore di Pisa under the direction of Prof. Ennio De Giorgi, Italy
Stages of academic/professional career	1990 – today, Full professor at University of Pisa, Italy 1986 – 1990, Full professor at University of Ferrara, Italy 1980 – 1986, Researcher at Scuola Normale Superiore di Pisa, Italy

Supplementary Career Information

One year (1978–1979) at École Normale Supérieure in Paris. One semester (1983–1984) at Institute for Mathematics and its Applications in Minneapolis.

Engagement in the Research System

— Participation to Editorial Boards of several international journals as :
Journal of Convex Analysis (managing editor),
ESAIM : Control, Optimisation and Calculus of Variations (COCV),
Journal of Optimization Theory and Applications,
Set-Valued and Variational Analysis : Theory and Applications,
Revista Matemática Complutense,
Applied Mathematics and Optimization,
ISRN Mathematical Analysis,
Pure and Applied Functional Analysis,
International Journal of Pure and Applied Mathematics (IJPAM),
International Journal of Differential Equations and Applications (IJDEA),
International Journal of Dynamical Systems and Differential Equations (IJDSDE),
Communications in Applied Analysis.

— Member in several Evaluation Committees of research centers and funding agencies :
AERES-HCERES (France) 2009, 2011, 2015, 2018
CMAF (Portugal) 2010
ANVUR (Italy) 2012
DFG (Germany) 2012, 2017

ERC (EU) 2014, 2016
IUF (France) 2014, 2015, 2016
MOSTA (Lithuania) 2018, 2023

Supervision of Researchers in Early Career Phases (previous 5 years)

I have given many courses on several subjects in Mathematical Analysis, at Bachelor level, Master level and Ph.D. level. I supervised 20 Master theses and 23 Ph.D. theses. The most recent ones are :

— Harish Shrivastava : *Shape optimisation problems for integral functionals and regularity properties of optimal domains*. PhD thesis at Università di Pisa, 2018.

— Francesco Paolo Maiale : *Shape optimization problems and regularity of the free bound- aries*. PhD thesis at Scuola Normale Superiore di Pisa, 2022.

— Luca Briani : *Shape optimization problems with competing terms*. PhD thesis at Università di Pisa, 2023.

Scientific Results

The full list of publications, with an extended curriculum, is available at `https://people.dm.unipi.it/buttazzo/`

Category A - 10 items

1. C. Baiocchi, G. Buttazzo, F. Gastaldi, F. Tomarelli. General existence theorems for unilateral problems in continuum mechanics. *Arch. Rational Mech. Anal.*, 100 (2) (1988), 149–189.
2. G. Buttazzo. Semicontinuity, Relaxation and Integral Representation in the Calculus of Variations. *Pitman Res. Notes Math. Ser. 207, Longman, Harlow* (1989).
3. E. Acerbi, G. Buttazzo, D. Percivale. A variational definition of the strain energy for an elastic string. *J. Elasticity*, 25 (2) (1991), 137–148.
4. G. Buttazzo, G. Dal Maso. An existence result for a class of shape optimization problems. *Arch. Rational Mech. Anal.*, 122 (2) (1993), 183–195
5. L. Ambrosio, G. Buttazzo. An optimal design problem with perimeter penalization. *Calc. Var. Partial Differential Equations*, 1 (1) (1993), 55–69.
6. G. Buttazzo, M. Giaquinta, S. Hildebrandt. One-dimensional Calculus of Variations : an Introduction. *Oxford University Press, Oxford* (1998). Russian translation : Tamara Rozhkovskaya, Novosibirsk (2002).
7. G. Bouchitté, G. Buttazzo. Characterization of optimal shapes and masses through Monge-Kantorovich equation. *J. Eur. Math. Soc.*, 3 (2001), 139–168.
8. D. Bucur, G. Buttazzo. Variational Methods in Shape Optimization Problems. *Progress in Nonlinear Differential Equations 65*, Birkhäuser Verlag, Basel (2005).
9. H. Attouch, G. Buttazzo, G. Michaille. Variational Analysis in Sobolev and BV Spaces : Applications to PDEs and Optimization. *MOS-SIAM Book Series on Optimization 17*, SIAM, Philadelphia (2014).
10. G. Bouchitté, G. Buttazzo, T. Champion, L. De Pascale. Relaxed multi-marginal costs and quantization effects. *Ann. Inst. H. Poincaré Anal. Non Linéaire*, 38 (2021), 61–90.

Category B - 10 items

1. E. De Giorgi, G. Buttazzo, G. Dal Maso. On the lower semicontinuity of certain integral functionals. *Atti Accad. Naz. Lincei Rend. Cl. Sci. Fis. Mat. Nat.*, 74 (5) (1983), 274–282.
2. G. Buttazzo, R.V. Kohn. Reinforcement by a thin layer with oscillating thickness. *Appl. Math. Optim.*, 16 (3) (1987), 247–261.

3. G. Buttazzo, G. Dal Maso. Shape optimization for Dirichlet problems : relaxed formulation and optimality conditions. *Appl. Math. Optim.*, 23 (1) (1991), 17–49.
4. G. Buttazzo, B. Kawohl. On Newton's problem of minimal resistance. *Math. Intelligencer*, 15 (4) (1993), 7–12.
5. G. Buttazzo, V. Ferone, B. Kawohl. Minimum problems over sets of concave functions and related questions. *Math. Nachr.*, 173 (1995), 71–89.
6. G. Bouchitté, G. Buttazzo, P. Seppecher. Energies with respect to a measure and applications to low-dimensional structures. *Calc. Var. Partial Differential Equations*, 5 (1) (1997), 37–54.
7. D. Bucur, G. Buttazzo, A. Henrot. Existence results for some optimal partition problems. *Adv. Math. Sci. Appl.*, 8 (2) (1998), 571–579.
8. L. Ambrosio, O. Ascenzi, G. Buttazzo. Lipschitz regularity for minimizers of integral functionals with highly discontinuous integrands. *J. Math. Anal. Appl.*, 142 (2) (1989), 301–316.
9. G. Bouchitté, G. Buttazzo. New lower semicontinuity results for nonconvex functionals defined on measures. *Nonlinear Anal.*, 15 (7) (1990), 679–692.
10. G. Buttazzo, E. Stepanov. Optimal transportation networks as free Dirichlet regions for the Monge-Kantorovich problem. *Ann. Sc. Norm. Super. Pisa Cl. Sci.*, 2 (4) (2003), 631–678.

Academic Distinctions

— Santaló lecturer for 2010 at Universidad Complutense de Madrid ;
— Winner of "Premio Luigi e Wanda Amerio 2011", awarded by the "Istituto Lombardo Accademia di Scienze e Lettere".

In addition, I have been, since a long time, the scientific responsible of a research group in Pisa that has always been funded by the Italian Ministry of University and Research (MIUR).

Other Information

My scientific research has been mainly devoted to the following fields, in which I published more than 220 papers and several books. On these subjects I have given lectures at many Universities in Italy and abroad.

— General theory of Γ-convergence
— Γ-convergence for functionals of the calculus of variations
— Bounce problems on Riemannian manifolds
— Semicontinuity and relaxation for integral functionals
— Optimal control problems : relaxed controls and limit problems
— Continuous operators between function spaces
— Singular perturbation problems
— Integral representation theory for local functionals
— Limit problems and asymptotic analysis in the continuum mechanics
— Existence theory for unilateral problems in linear and nonlinear elasticity
— Macroscopic behaviour of elastic periodic networks : homogenization
— Variational problems with a lack of coercivity
— Quasilinear elliptic equations
— Functionals defined on the space of measures
— The Lavrentiev Phenomenon in the calculus of variations
— Shape optimization problems
— Optimization problems in mass transportation theory