

Europass Curriculum Vitae

Personal information

Surname / First name

Belloni Valeria

Research and professional activities

Position held

October 2017 - now

Main research
subjects

PhD student at the **Geodesy and Geomatics Division** of **Sapienza** University of Rome

Full-field displacement and strain measurements with Digital Image Correlation
Automatic crack detection and measure using deep learning and photogrammetry
Fast displacement monitoring with COSMO-SkyMed and TerraSAR-X measurements
Close-range photogrammetry for 3D modeling of glaciers

Position held

January 2020 - May 2020

Main research
subject

Visiting PhD student at the **Geoinformatics Division of KTH - Royal Institute of Technology** of Stockholm

Tunnels automatic crack monitoring using deep learning and photogrammetry (TACK project)

Position held

March 2019 - June 2019

Main research
subject

Visiting PhD student at the **Geoinformatics Division of KTH - Royal Institute of Technology** of Stockholm

Full-field displacement measurements with Digital Image Correlation: application to lab tests and tunnel monitoring

Position held

October 2018 - December 2018

Main research
subject

Visiting PhD student at the **Geoinformatics Division of KTH - Royal Institute of Technology** of Stockholm

Full-field displacement measurements with Digital Image Correlation: application to lab tests and tunnel monitoring

Position held

April 2017 - July 2017

Employer

Independent contractor

INTEGRA S.r.l. – Ingegneria, Territorio, Grandi infrastrutture, Via di S.Erasmo 16, 00184, Rome, Italy

Principal Subjects/occupational
skills covered

Flexible wall design and slope stability analysis with Paratie Plus. Rain-water collection system design

Research topics

Photogrammetry

Photogrammetric techniques for strain and displacement measurements in the field of structural monitoring (Digital Image Correlation). Close-range photogrammetry for 3D modeling of glaciers and human infrastructures

Satellite Remote Sensing

Model and algorithm development for displacement monitoring using SAR imagery (e.g. COSMO-SkyMed, TerraSAR-X and ICEYE). DSM generation from optical and SAR imagery using commercial and open source software packages

Computer Vision

Deep learning architectures for crack detection in concrete material. Computer Vision libraries and techniques (e.g Structure from Motion - SfM): usage and analysis

R&D projects

- 2019 - now Research activity in the **TACK - Tunnels Automatic Crack Monitoring using Deep Learning project** (InfraSweden 2030 Vinnova - Sweden), aimed at crack monitoring in tunnels. The goal is to investigate and develop a new technique to detect and measure cracks using deep learning and photogrammetry
- 2018 Investigator of the project **A new FOS methodology for Digital Image Correlation in the field of displacement measurement in structural applications** funded by Sapienza University of Rome with a grant for young researchers (**Avvio alla ricerca 2018**). The goal is to develop and improve a new Digital Image Correlation software
- 2017 - 2020 Research activity in the **Glaciovar project** (DARAS, Presidenza del Consiglio dei Ministri) aimed at 3D modeling through photogrammetric techniques. The goal is to reconstruct the morphology of glaciers to study the evolution and change in mass and volume

Organization of international congresses

- June 2018 Member of the Local Organizing Committee of the IX Hotine-Marussi Symposium

Teaching experience

- October 2017 - now Collaboration in lectures and exam sessions in **Positioning** and **Geomatics and Geographic Information Systems** courses in Environmental Engineering at the Civil and Industrial Engineering Faculty of **Sapienza** University of Rome
- October 2019 - now Co-supervisor of one Bachelor Degree Thesis and one Master Thesis about Geomatics at the Civil and Industrial Engineering Faculty of **Sapienza** University of Rome

Awards and acknowledgements

- November 2020 Second place at the **Farming by Satellite 2020** competition - Genuine solution
- April 2020 Nominated **Cultore della materia** in Positioning and Geomatics (ICAR/06 - Topography and cartography) at the Department of Civil, Building and Environmental Engineering of Sapienza University of Rome, Academic Year 2019-2020
- March-November 2020 As part of the TACK team, selected for the **Bicky Chakraborty Entrepreneur Program**, KTH Royal Institute of Technology
- January 2020 As part of the TACK team, nominated for the **Royal Swedish Academy of Engineering Sciences (IVA) top 100 list of innovative research projects**
- November 2018 Selected for the **Joint research projects** for PhD student mobility abroad funded by Sapienza University of Rome. Project title: Remote sensing and structural applications of latest generation matching algorithm
- October 2018 Selected for the **ESA Academy - Earth Observation Satellite System Design Training Course 2018**
- May 2017 **Sapienza Excellent Student Award** for the Academic Year 2015-2016
- January 2017 **Honours Programme** - Master of Science in Environmental Engineering for the Academic Year 2015-2016

Education and qualification

January 2017
Final mark
Thesis title

Institute of Education

November 2014
Final mark
Thesis title

Institute of Education

July 2011
Final mark
Institute of Education

January 2011
Institute

Personal skills and competences

Mother tongue
Other language(s)

*Self-assessment
European level^(*)*

English

French

Informatics skills

Professional qualification

January 2018

October 2017

Additional information

Driving Licence(s)

Master of Science (M.S.) degree in Environmental Engineering 110/110 with honours

A new Digital Image Correlation software for displacement field measurements in structural applications

Sapienza University of Rome

Bachelor of Science (B.S.) degree in Environmental Engineering 110/110 with honours

Preliminary analysis for the determination of the sailboat trim from GPS data in the frame of the Roma Ocean World project

Sapienza University of Rome

Scientific High School Diploma (PNI experimentation) 100/100

Scientific High School C. Cavour, Rome

Stage in astrophysics IASF/IFSI

ARTOV, Area della Ricerca di Tor Vergata, Rome

Italian

English (FIRST (FCE) – First Certificate in English)

Understanding				Speaking				Writing	
Listening		Reading		Spoken interaction		Spoken production			
C1	Proficient user	C1	Proficient user	C1	Proficient user	C1	Proficient user	C1	Proficient user
A1	Basic user	A1	Basic user	A1	Basic user	A1	Basic user	A1	Basic user

^(*) Common European Framework of Reference (CEF) level

Operating systems: Windows, UNIX/Linux, Mac OS X

Programming languages: Python, MATLAB, \LaTeX

Commercial Software: Agisoft Photoscan, Pix4D, Infinity, Vic-2D, AutoCAD

Open Source Software: SNAP, SNAP API from Python, Ncorr, DICe

Certifications: Introduction to Python programming (CINECA, 2018) Introduction to Scientific and Technical Computing in C (CINECA, 2018), Convolutional Neural Network offered by deeplearning.ai (Coursera)

Enrolled as a member of the Italian Engineering Society - Civil and Environmental Engineering - Rome (Ordine degli Ingegneri della Provincia di Roma)

Passed the qualification exam and licensed as a professional engineer

Driving licence category B

Publications

Lastilla, L., **Belloni, V.**, Ravanelli, R., Crespi, M.: DSM Generation from Single and Cross-Sensor Multi-View Satellite Images Using the New Agisoft Metashape: The Case Studies of Trento and Matera (Italy), *Remote Sensing*, 13, 593, <https://doi.org/10.3390/rs13040593>, 2021

Belloni, V., Sjölander, A., Ravanelli, R., Crespi, M. and Nascetti, A.: TACK project: tunnel and bridge automatic crack monitoring using deep learning and photogrammetry, *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, XLIII-B4-2020, 741-745, 2020

Di Rita M., Fugazza D., **Belloni V.**, Diolaiuti G., Scaioni M. and Crespi, M.: Glacier volume change monitoring from UAV observations: issues and potentialities of state-of-the-art techniques, *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, XLIII-B2-2020, 1041–1048, 2020

Belloni, V., Di Tullio, M., Ravanelli, R., Fratarcangeli, F., Nascetti, A. and Crespi, M.: COSMO-SkyMed range measurements for displacement monitoring using amplitude persistent scatterers, *2020 IEEE International Geoscience and Remote Sensing Symposium*, 2495-2498, 2020

Belloni, V., Ravanelli, R., Nascetti, A., Di Rita, M., Mattei, D., and Crespi, M.: py2DIC: A New Free and Open Source Software for Displacement and Strain Measurements in the Field of Experimental Mechanics, *Sensors*, 19(18), 3832, <https://doi.org/10.3390/s19183832>, 2019

Belloni, V., Ravanelli, R., Nascetti, A., Di Rita, M., Mattei, D., and Crespi, M.: Digital Image Correlation from commercial to FOS software: a mature technique for full-field displacement measurements, *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, XLII-2, 91-95, <https://doi.org/10.5194/isprs-archives-XLII-2-91-2018>, 2018

Belloni, V.: py2DIC: A new digital image correlation software for displacement field measurements, *Bollettino SIFET*, 1, 2018

Ravanelli, R., Nascetti, A., Di Rita, M., **Belloni, V.**, Mattei, D., Nisticó, N., and Crespi, M.: A new Digital Image Correlation software for displacements field measurement in structural applications, *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, XLII-4/W2, 139-145, <https://doi.org/10.5194/isprs-archives-XLII-4-W2-139-2017>, 2017

Ravanelli, R., Di Rita, M., **Belloni, V.**, Nascetti, A., Mazzoni, A., and Crespi M.: New trends in geomatics, in the era of lowcost sensors, free and open source software and hpc geobigdata infrastructures, *GEOMedia*, 21(3), 2017

In compliance with the *Italian legislative Decree no. 196 dated 30/06/2003*, I hereby authorize you to use and process my personal details contained in this document.

February 26, 2021

Valeria Belloni