FRANCESCO IOLI | CV

I am a PhD student in Geomatics with focus on photogrammetry and 3D reconstruction. I'm working on low-cost stereo-cameras and UAV SfM for glacier monitoring. I am a UAV pilot, licensed to operate in critical scenarios.

EXPERIENCE

PhD Student — Politecnico di Milano, DICA, 2020 - now

- My work focuses on photogrammetry and SfM for glacier monitoring. I work on UAV-photogrammetry for structural health assessment, with a focus on crack detection on concrete bridges.

Visiting PhD student — University of Twente, ITC, 2022

- Developing a wide-baseline stereo matching workflow with Deep Learning for 4D monitoring of an alpine glacier by using low-cost time-lapse cameras.

Teaching assistant — Politecnico di Milano, 2020 - now

- *Course of Trattamento delle Osservazini* (Statistics)
- *Course of Sistemi Informativi Territoriali* (GIS)
- *Course of Tecniche di rilievo e modellazione 3D per l'architettura* (3D modelling for architecture).

Tutoring — Politecnico di Milano, 2021 - 2022

- Tutor for the Summer School *Design and Execution of Topographic Surveys for Land Monitoring* at the Belvedere Glacier (Italian Alps) aimed at introducing BSc and MSc students to topographic fielworks in mountain environments.

Internship — Politecnico di Milano, LabMGF, 2020

- Conducted fielworks for surveying of bridges with UAV-photogrammetry, GNSS, Laser Scanner and Total station, as well as producing tecnical drawing from photogrammetric point clouds.

EDUCATION

MSc in Environmental and Land Planning Engineering — Politecnico di Milano, 2017 - 2020

- Major in Land Monitoring and Diagnostics. Grade 110L/110.

Visiting student for MSc thesis development — ETH Zürich, VAW, 2019 - 2020

- MSc Thesis: *Evaluation of Airborne Image Velocimetry approaches with low-cost UAVs in riverine environments*. Supervisors: Prof. Livio Pinto, Dr. Martin Detert.

Erasmus exchange — Aalto University (Helsinki), 2019

BSc in Environmental and Land Planning Engineering — Politecnico di Milano, 2014 - 2017

- BSc Thesis: *Snowpack surveys aimed at hydrological analysis: a case study carried out with UAVs and manual probing measurements on the Belvedere glacier (Macugnaga, Italian Alps)*. Grade 102/110.

PROJECTS

- ICEpy4D: a multi-purpose Python package for 4D Image-based Continuos monitoring of glaciers' Evolution with deep learning SfM and low-cost stereo-cameras
- Long-term photogrammetric monitoring of the deris-covered Belvedere Glacier (Italian Alps)
- UAV photogrammetry for structural 3D reconstruction and crack assessment

CONTACT

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PROGRAMMING

Python ★★★★
Matlab ★★★☆
C++ ★☆☆☆
Git ★★★☆

PHOTOGRAMMETRY

Agisoft Metashape
Photomodeler
CloudCompare
Colmap

TOOLS

QGIS, ESRI ArcGIS
Leica Infinity, rtklib
Photoshop, Lightrooom
GIMP, Inkscape
AutoCAD, ReCap
Latex
Terminal
Proxmox VE, TrueNas

OPERATING SYSTEMS

LANGUAGES

Italian: mother tongue
English: C1 (IELTS certificate)

ACTIVITIES

SKILLS

- ICEpy4D: a multi-purpose Python package for 4D Image-based Continuos monitoring of glaciers' Evolution with deep learning SfM and low-cost stereo-cameras

PUBBLICATIONS

- Ioli, F., Bianchi, A., Cina, A., De Michele, C., Maschio, P., Passoni, D., Pinto, L., 2022. Mid-Term Monitoring of Glacier's Variations with UAVs: The Example of the Belvedere Glacier. *Remote Sensing* 14, 28
- Gaspari, F., Ioli, F., Barbieri, F., Belcore, E.,Pinto, L., 2022. Integration of UAV-Lidar and UAV-photgrammetry for Infrastructure Monitoring and Bridge Assessment. *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.* XLIII-B2-2022, 995–1002
- Ioli, F., Pinto, A., Pinto, L., 2022. UAV-Photogrammetry for Metric Evaluation of Concrete Bridge Cracks. *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.* XLIII-B2-2022, 1025–1032
- De Gaetani, C.I., Ioli, F., Pinto, L., 2021. Aerial and UAV Images for Photogrammetric Analysis of Belvedere Glacier Evolution in the Period 1977–2019. *Remote Sensing* 13, 3787.
- Ioli, F., Pinto, L., and Ferrario, F., 2021. Low-cost Assisted Aerial Triangulation for Sub-decimetric Accuracy with non-RTK UAVs. *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.* XLIII-B2-2021, 25–32
- Ioli, F., Pinto, L., Passoni, D., Nova, V., Detert, M., 2020. Evaluation of Airborne Image Velocimetry approaches using low-cost UAVs in riverine Environments. *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.* Vol.XLIII-B2-2020, 597–604.
- For a complete and up-to-date publication list, visit Francesco Ioli Scholar page.

ADDITIONAL INFORMATION

- Driving license: B
- UAS license: EASA A2 Open Category, with license for critical standard scenarios
- Professional qualification: *Esame di Stato* for Civil and Environmental Engineers

VOLUNTEER EXPERIENCE

- Scout chief: Children's educator in the Italian Scout association *AGESCI* — 2017 - now
- Operazione Mato Grosso: Volunteer for charity organization *Operazione Mato Grosso* — 2016 - 2017
- Libera. Associazioni, Nomi e Numeri contro le mafie: Volunteer for anti-mafia and civil rights association *Libera* — 2012 - 2016