

H2I Workshop – Welcome!

16 September 2021

unibz — Fakultät für Informatik
Facoltà di Scienze e Tecnologie informatiche
Faculty of Computer Science

efre · fesr
Südtirol · Alto Adige

Europäischer Fonds für regionale Entwicklung
Fondo europeo di sviluppo regionale



AUTONOME
PROVINZ
BOZEN
SÜDTIROL



PROVINCIA
AUTONOMA
DI BOLZANO
ALTO ADIGE



Outline

- The H2I Project
- H2I Workshop's program

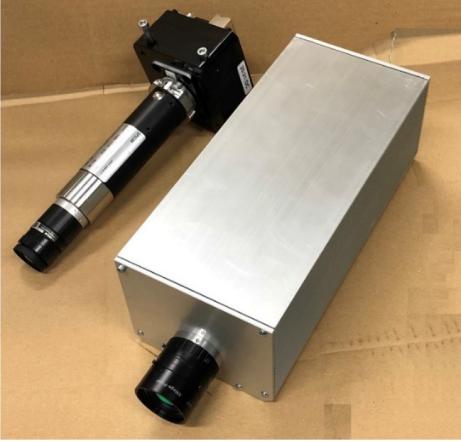
H2I Project

- H2I: “Immagini Iperspettrali per l’ispezione del legno e della frutta” is an EFRE/FESR funded project run by UniBZ and Microtec srl H2I
- The Project has a duration of almost 3 years (Jan. 2019 – Mar. 2022)
- Objectives:
 - To develop a Hyperspectral image acquisition platform.
 - To develop a Deep Learning algorithms able to deal with hyperspectral images.

H2I Project

- There are two main problems related with Hyperspectral Images:
 - Hardware platforms are expensive and complex.
 - Extracting useful information from Hyperspectral Images is complicated because the spectral dimension is present in addition to the spatial dimension.

H2I Project



I due sensori iperspettrali sviluppati; intervallo di lunghezze d'onda VIS/NIR (sinistra) e SWIR (destra).

because the spectral dimension is pre dimension.

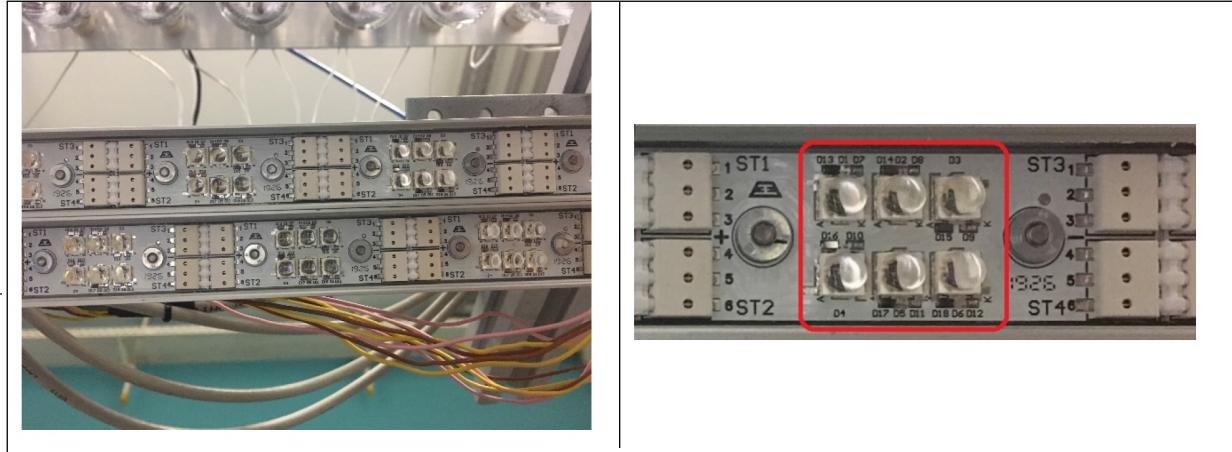
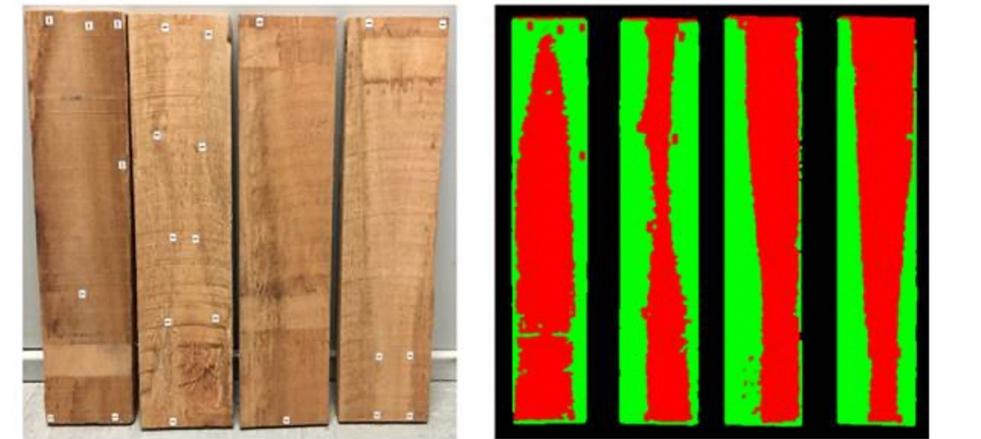
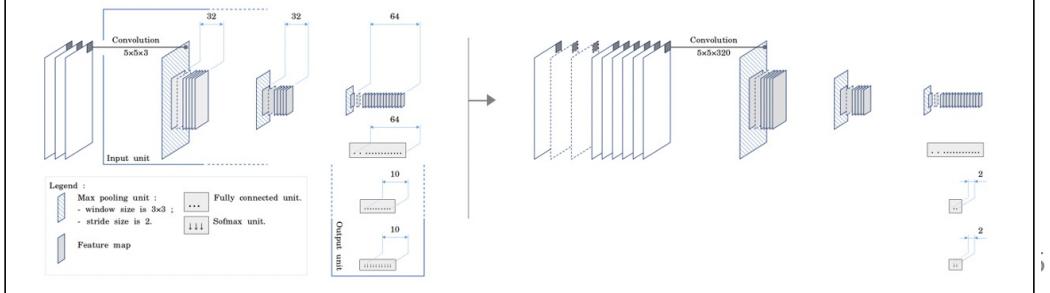


Foto di un tratto di lampo colore differente, per rete puntuale è causa di alc

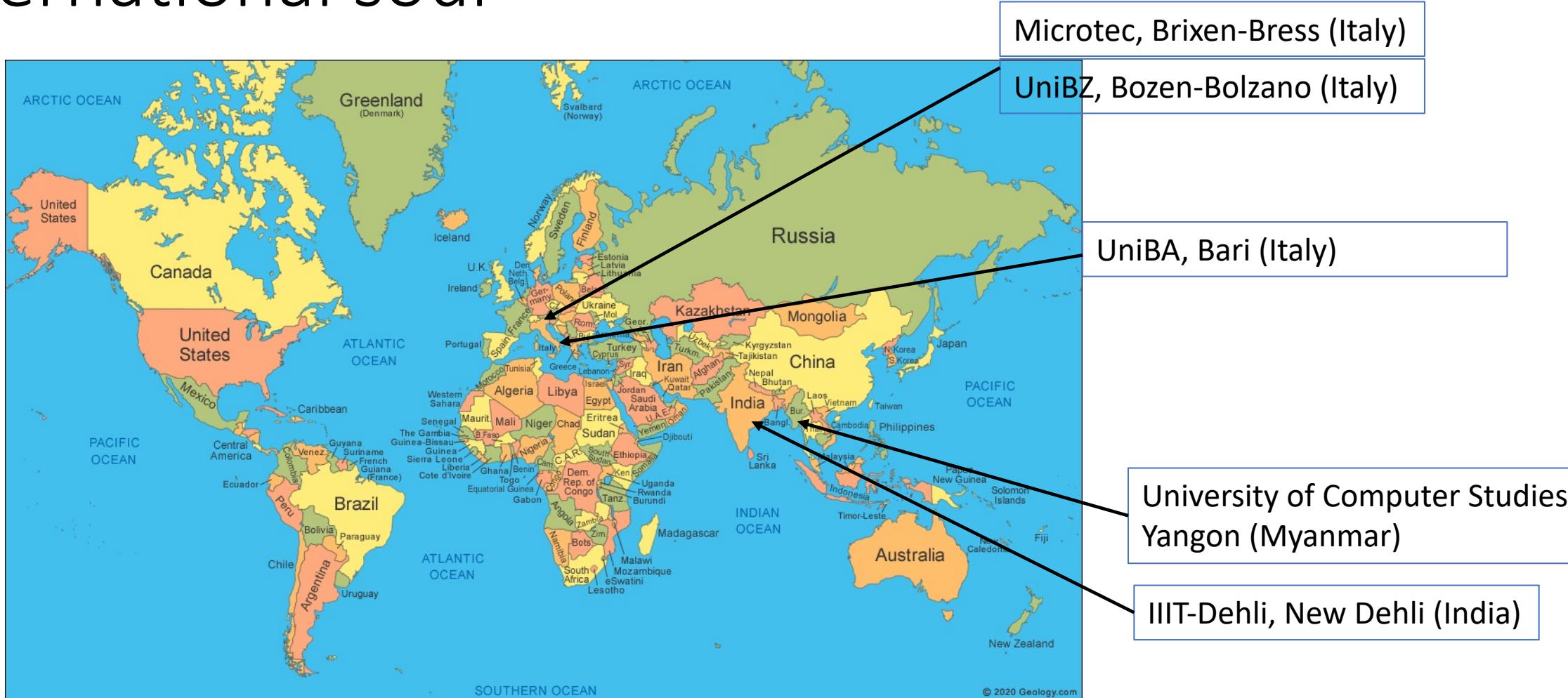
Beispiel für Splint-/Kernholzsortierung an Brettern



Deep-Learning-Architektur für die Klassifikation von hyperspektralen Bildern (Splint-/Kernholzsortierung)



H2I Project - A local project with an international soul



Workshop – Schedule

- **Welcome and Introduction**
 - 9:00-9:15: Workshop program overview
- **Data modelling using Hyper-spectral images**
 - 9:15-10:00: Wood industry
 - 10:00-10:30: Hyper-spectral images
 - 10:30-11:00: Hyper-spectral images acquisition
- 11:00-11:15 - Break
- **Image classification using Deep Learning**
 - 11:15-11:45: Classification using CNNs
 - 12:00-12:15: Segmentation Framework for Hyper-spectral images
- 12:15-13:45 - Break
- **Hands-on sessions**
 - 13:45-14:15: Spatial Classification of Hyper-spectral images
 - 14:15-14:45: Spectral Classification of Hyper-spectral images
 - 14:45-15:30: Data Augmentation of Hyper-spectral images
 - 15:30-16:00: Fungi detection
- 16:00-16:15 - Break
- **Wood analysis using X-ray and molecular techniques**
 - 16:15-16:45: Wood analysis using tomographic and X-ray micro-fluorescence techniques
 - 16:45-17:00: Towards molecular analysis of wood
- 17:00-17:15 - **Closing and Wrap-up**

A big thank to:

- Tammam Tillo, IIIT-Dehli
- Youry Pii, UniBZ
- Attaullah Buriro, UniBZ
- Boyuan Sun, UniBZ
- Davide Cremonini, UniBZ
- Salim Malek, Fondazione Bruno Kessler (and previously UniBZ)
- Matteo Caffini, Microtec srl
- Simone Faccini, Microtec srl
- Marco Boschetti, Microtec srrl and covisionLab
- Philipp Bock, Microtec srl
- Phyu Phyu Htun, University of Computer Studies, Yangon, Myanmar
- Ah Nge Htwe, University of Computer Studies, Yangon, Myanmar
- Roberto Terzano, UniBA
- Carlo Porfido, UniBA

Workshop – Detailed Schedule

- Wood and Hyper-spectral images (Microtec srl)
- Image Classification with Deep Learning (UniBZ)
 - Introduction (RobertoC and Tammam)
 - Spatial classifier for Hyper-spectral Images for Wood Detection (Phyu Phyu)
 - Spectral classifier for Hyper-spectral Images for Wood Detection (Boyuan)
 - Spatial Data Augmentation via Geometric Transformations (Salim)
 - Spectral Data Augmentation via GANs (Attaullah)
 - Spatial classifier for Hyper-spectral Images for Fungi Detection (Davide)
- Analysis of wood (UniBZ and UniBA)
 - Wood analysis using tomographic and X-ray micro-fluorescence techniques (RobertoT and Carlo)
 - Towards molecular analysis of wood (Youry)

Thanks!

🏠 <https://h2i.inf.unibz.it/>

✉️ h2i-fesr@googlegroups.com