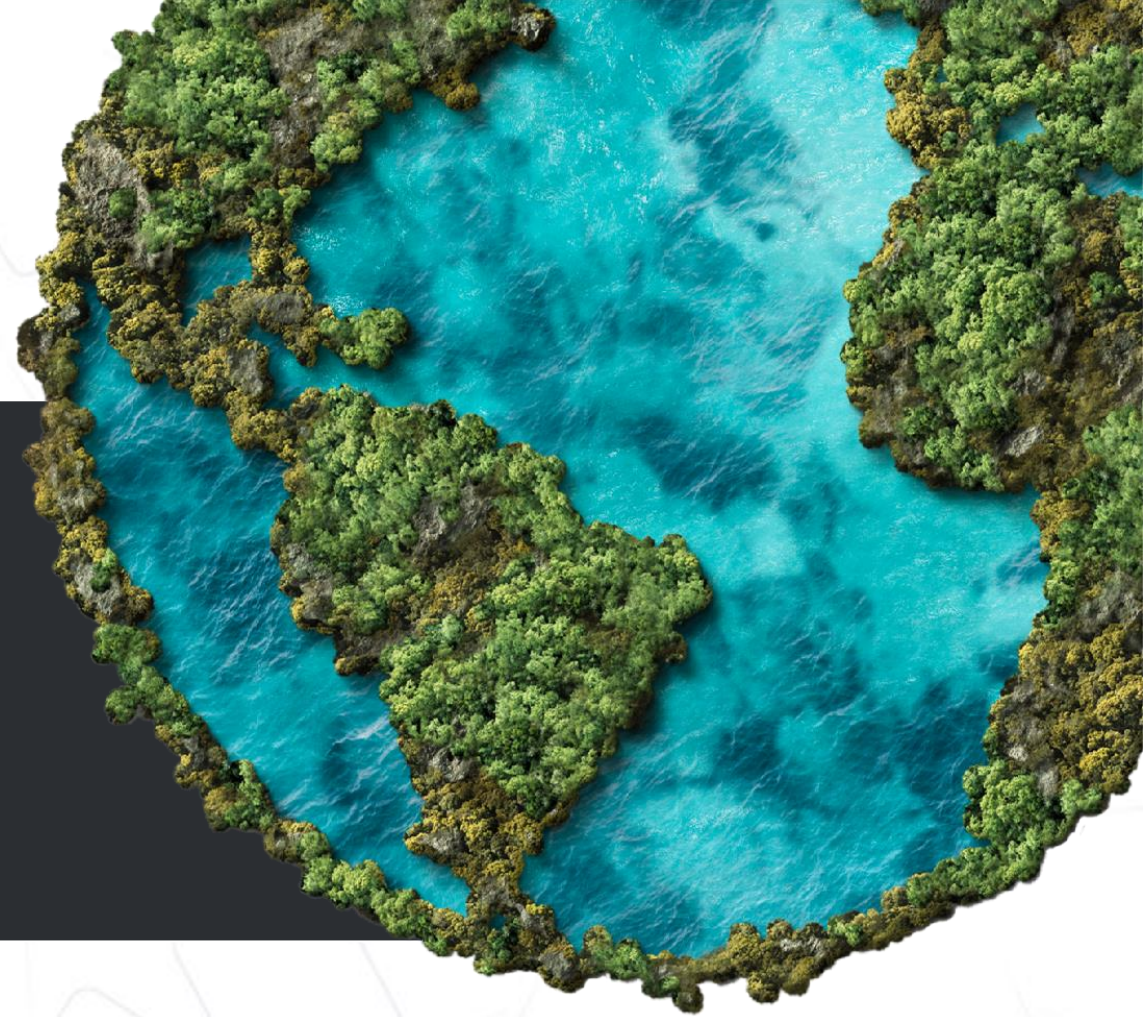




# Crowd4SDG Final Conference

Enhancing citizen science tools  
with AI to improve data quality  
and leverage social media

Barbara Pernici, Politecnico di Milano  
Geneva, CERN – March 17, 2023



*This project has received funding from the European Union's Horizon 2020  
research and innovation programme under grant agreement No 872944*





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## Motivation

1. Towards improving indicator 13.1.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population
2. Support emergency response with evidence-based content from social media



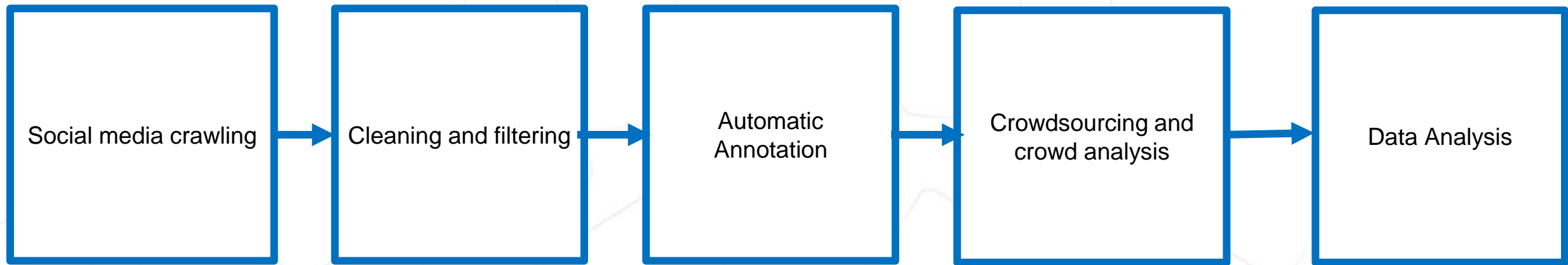


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## Crowd4SDG data pipeline

### Data preparation

### Data analysis



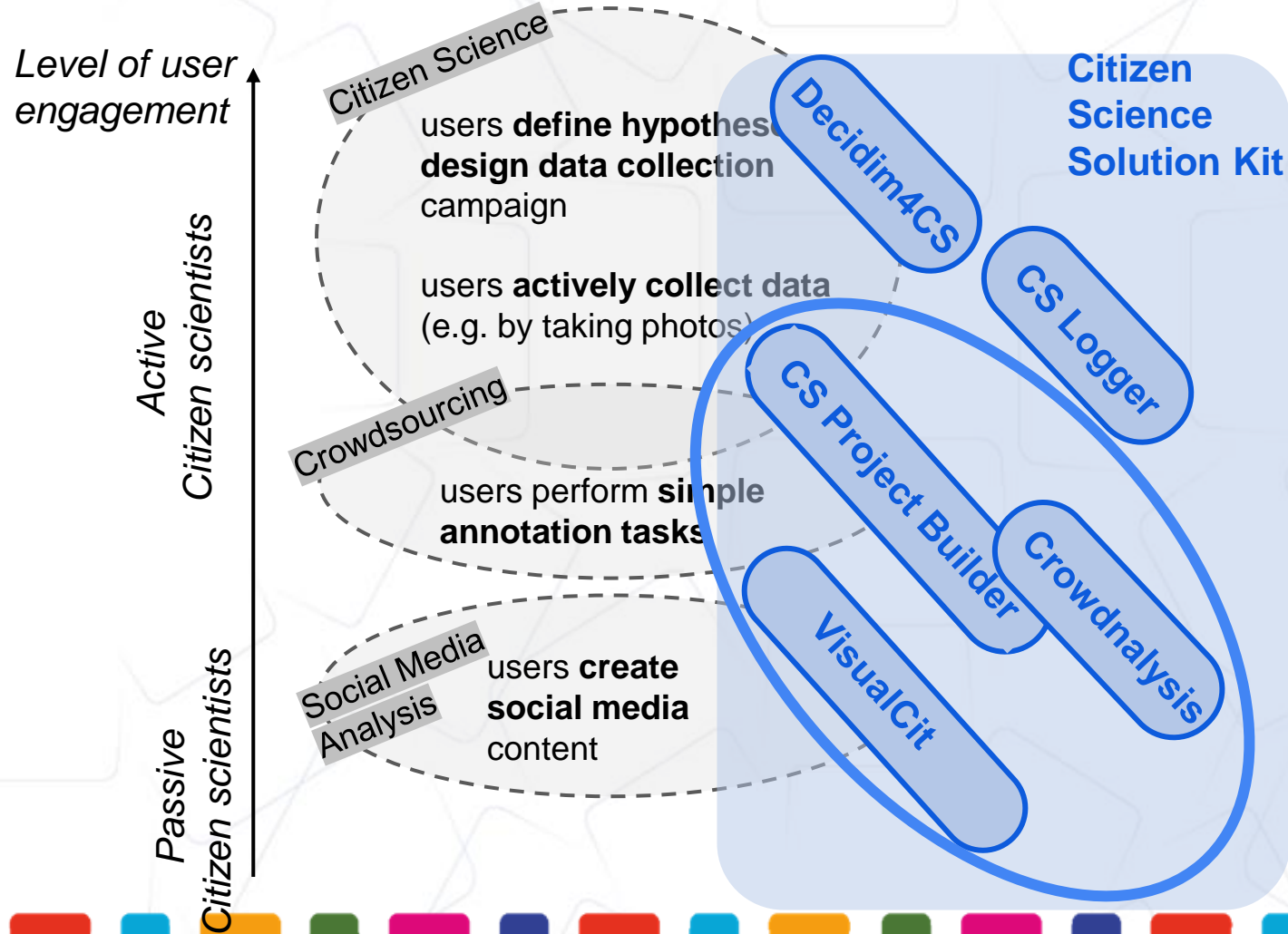
*C. Bono et al., A Citizen Science Approach for Analyzing Social Media With Crowdsourcing, IEEE Access, 2023*





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## Crowd4SDG Citizen Science Solution Kit







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## Contribution of CS

- Social media posting
- Annotate images
- Help in image geolocation



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## Problems and AI-based solutions

### Problems

- Many irrelevant posts
- Uncertainty of CS annotations

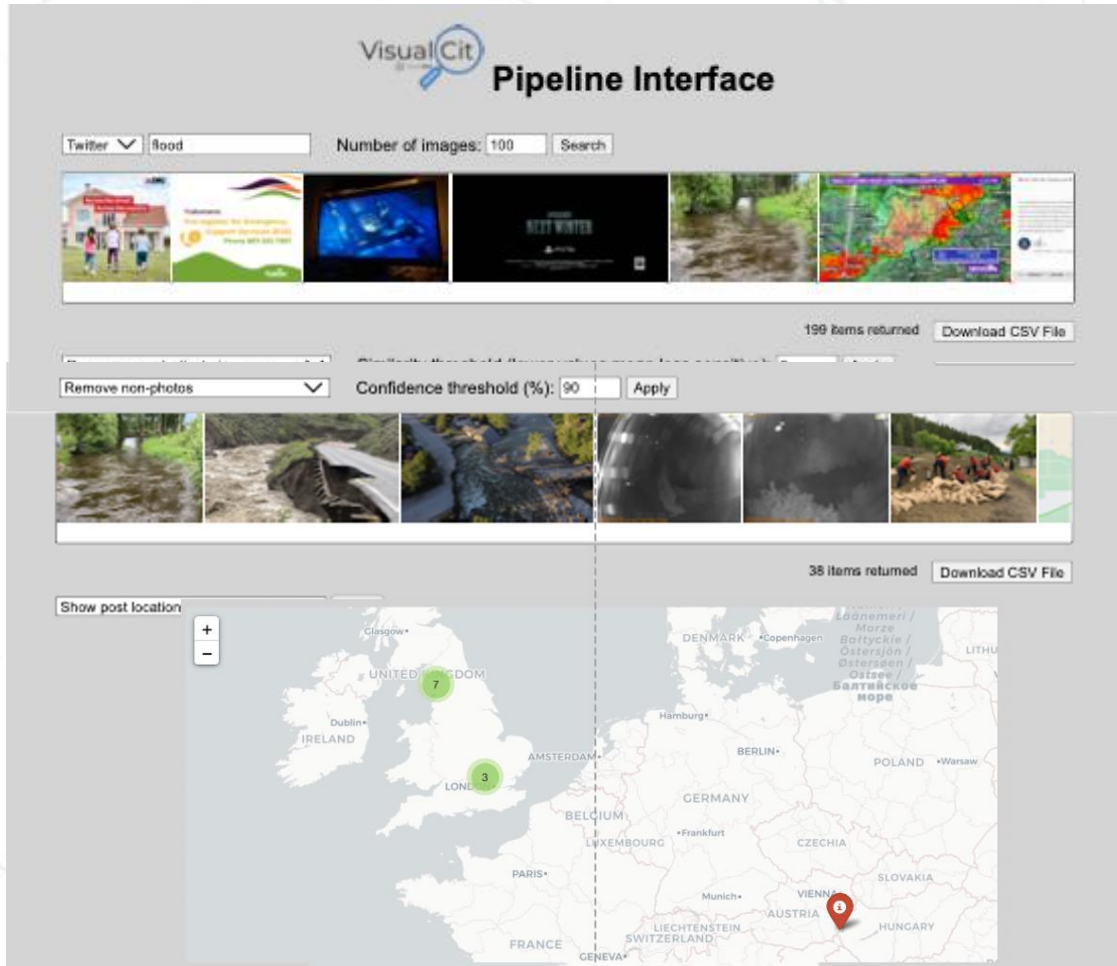
### Solutions

- Automatic classification
- Consensus evaluation



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## AI-based post selection



- Image classification (multiple classifiers)
- Geolocation
- Quality analysis: precision, recall

Tool: VisualCit





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## CS and crowdsourcing

HOME TOOLS DISCOVER BARBARAPERNICI

Go back to the project

Is this a flood image?

YES NO

Are there people in it?

YES NO

Are there more women than men?

YES NO CANT TELL

Do they seem in danger?

YES NO CANT TELL

Are there shelters nearby? (Any place giving temporary protection from bad weather)

YES NO CANT TELL

The following link to the tweet might help in answering to the questions :  
<http://twitter.com/anuuser/status/1392920268406939654>



- Crowdsourcing (Ask the CS)
- Consensus analysis (Not only majority voting)

Tools: CS Project Builder  
and Crowdanalysis

C. Bono et al., A Citizen Science Approach for Analyzing Social Media With Crowdsourcing, IEEE Access, 2023







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## Applications

### Case studies

- Albania earthquakes
- Floods (Nepal, Thailand, Central America)
- COVID behavior analysis

### Different possible paths

Actor	Raw Data Source	Image Filtering	Geolocalization	Text Analysis	Cleaned Source	Crowd Sourcing	Crowd Analysis	Target
Tool Case	<i>Social Media Crawling</i>	<i>VisualCit</i>	<i>VisualCit</i>	<i>VisualCit TriggerCit</i>	<i>External Dataset</i>	<i>CS Project Builder</i>	<i>Crowdanalysis</i>	
A					1	2	3	Text Input
B		4			1	2	3	Annotated Image
C	1	2	3			4	5	Indicator
D	1	2	3					Alert
E	1	2	3	4				Alert



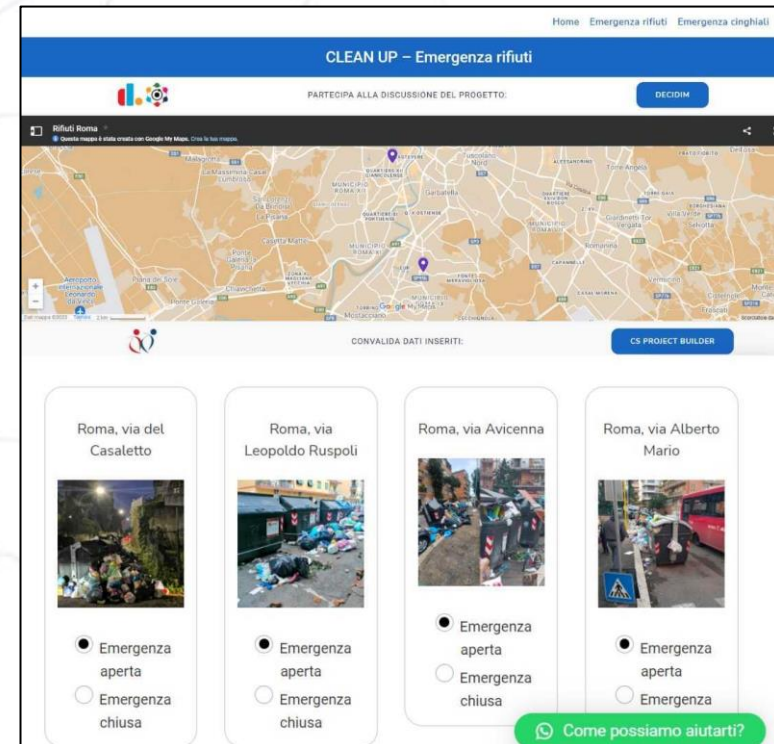


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## Conclusions and future work

- Integration of different social media
- AI to study evolution in time
- Further quality analysis of results

### GEAR 3 RESULTS – CLEAN UP project



by Giulia Andreasi Bassi, Glory Enoche Alapa,  
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Maria Rosa  
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