

# Extending Rapid Image Classification with the Picture Pile Platform for Citizen Science

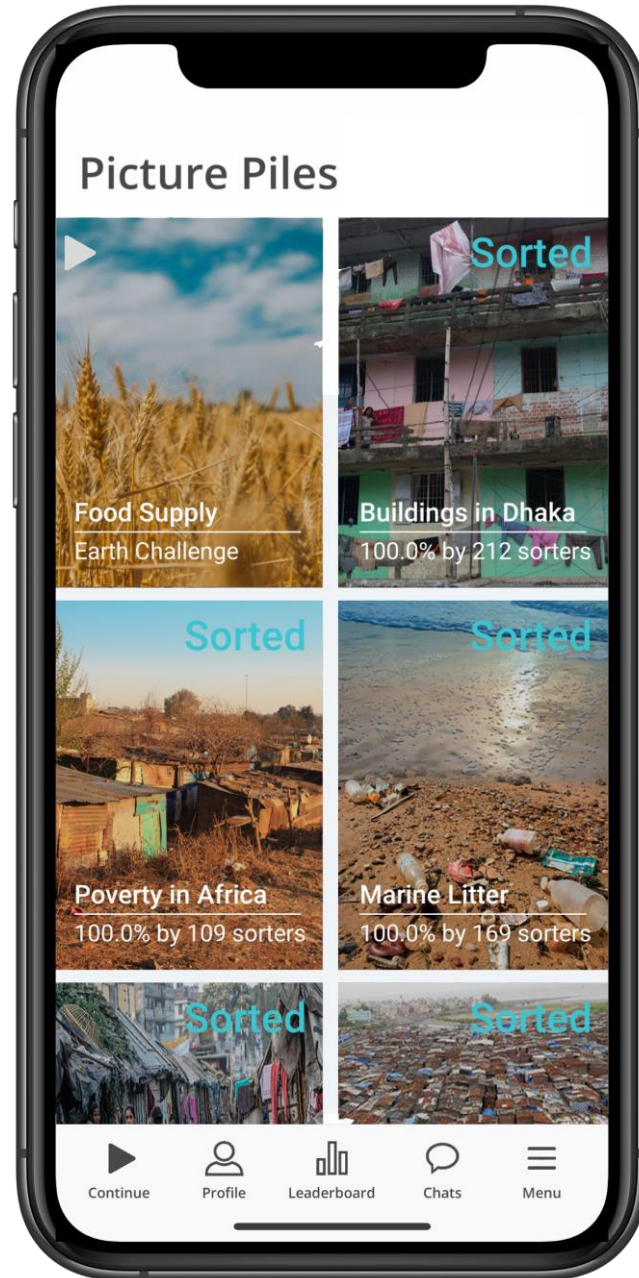
Tobias Sturn, Research Scholar

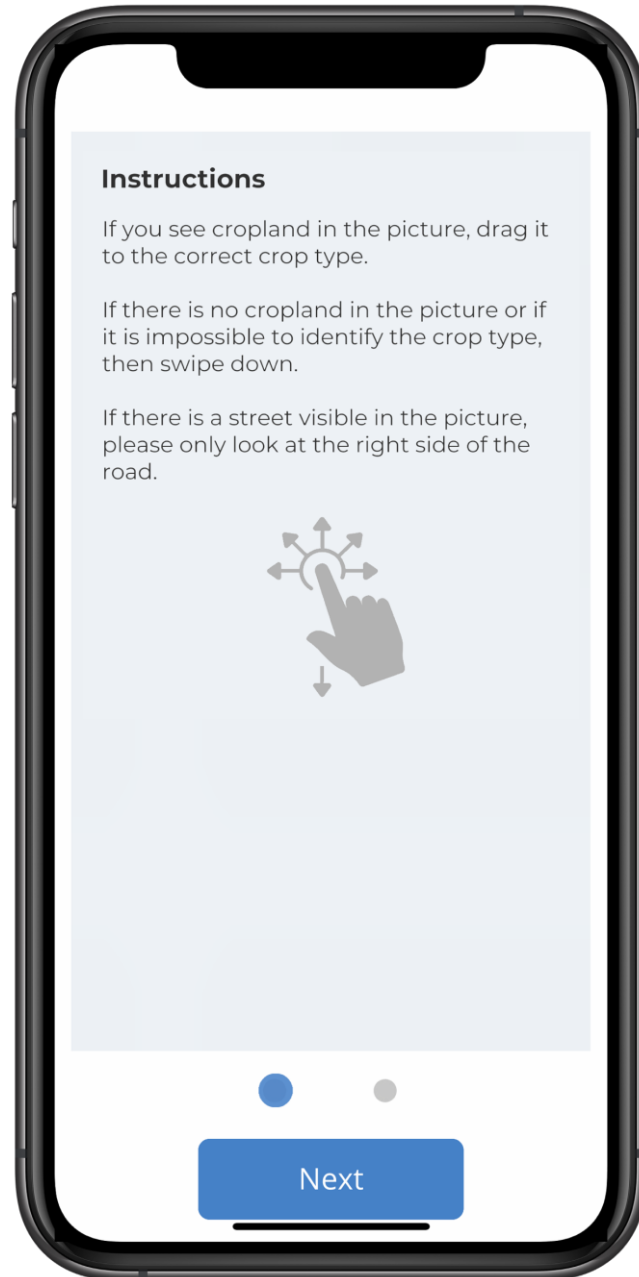
Novel Data Ecosystems for Sustainability (NoDES) Research Group

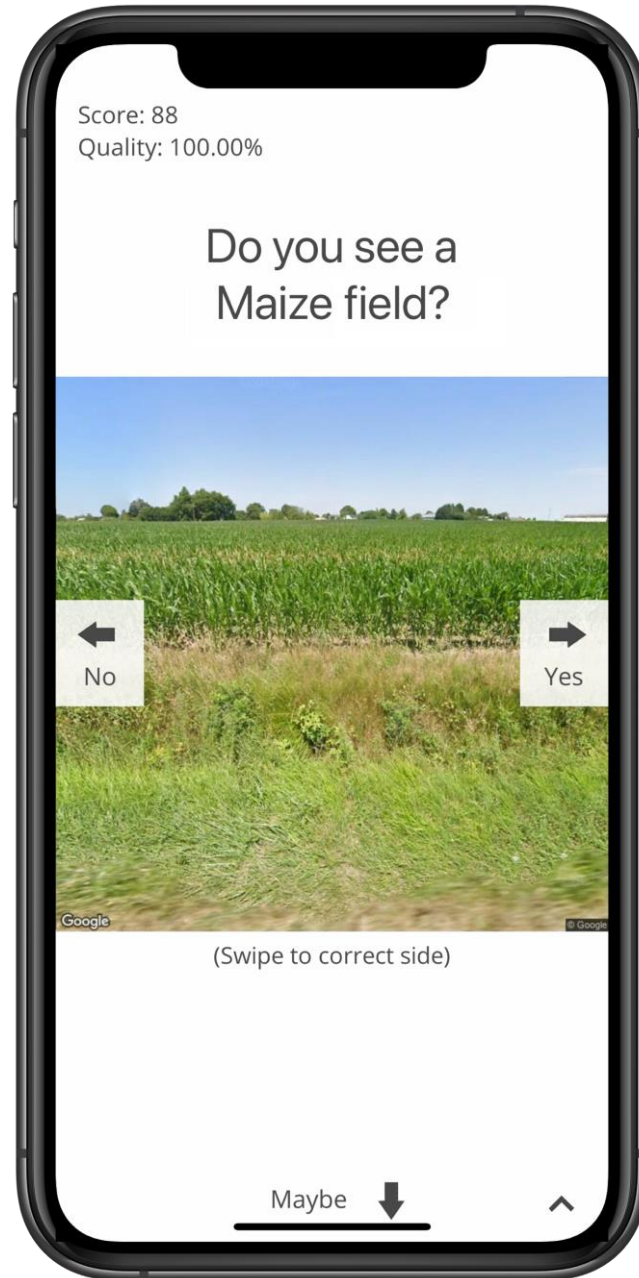
Advancing Systems Analysis Program

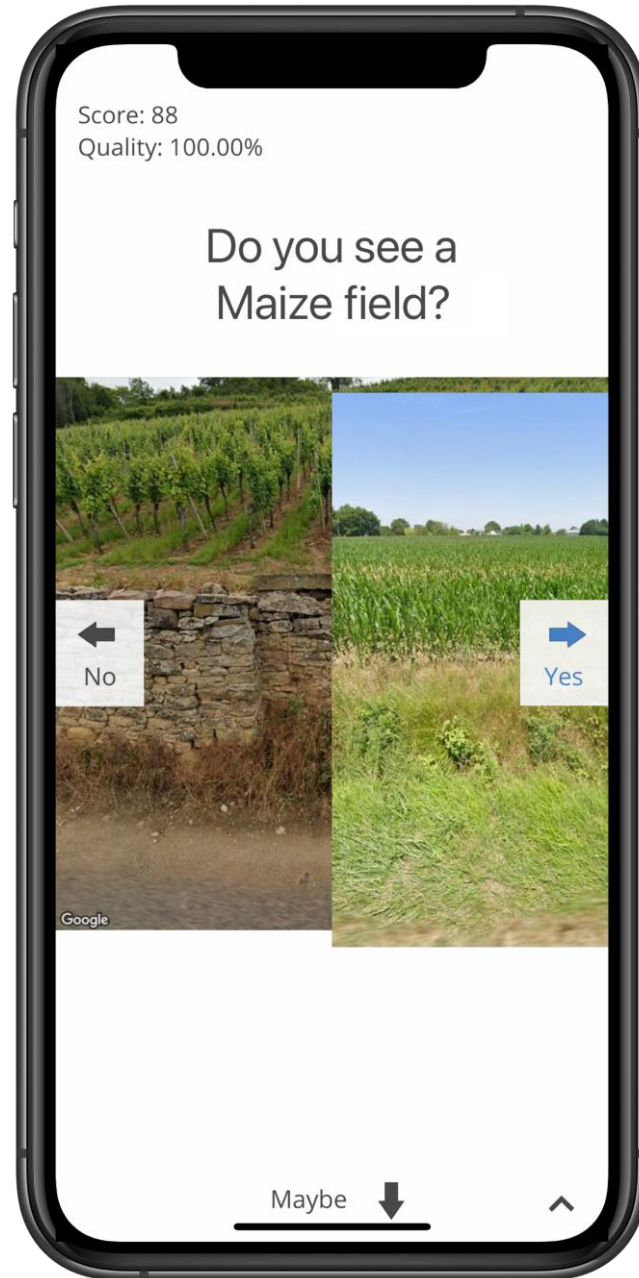


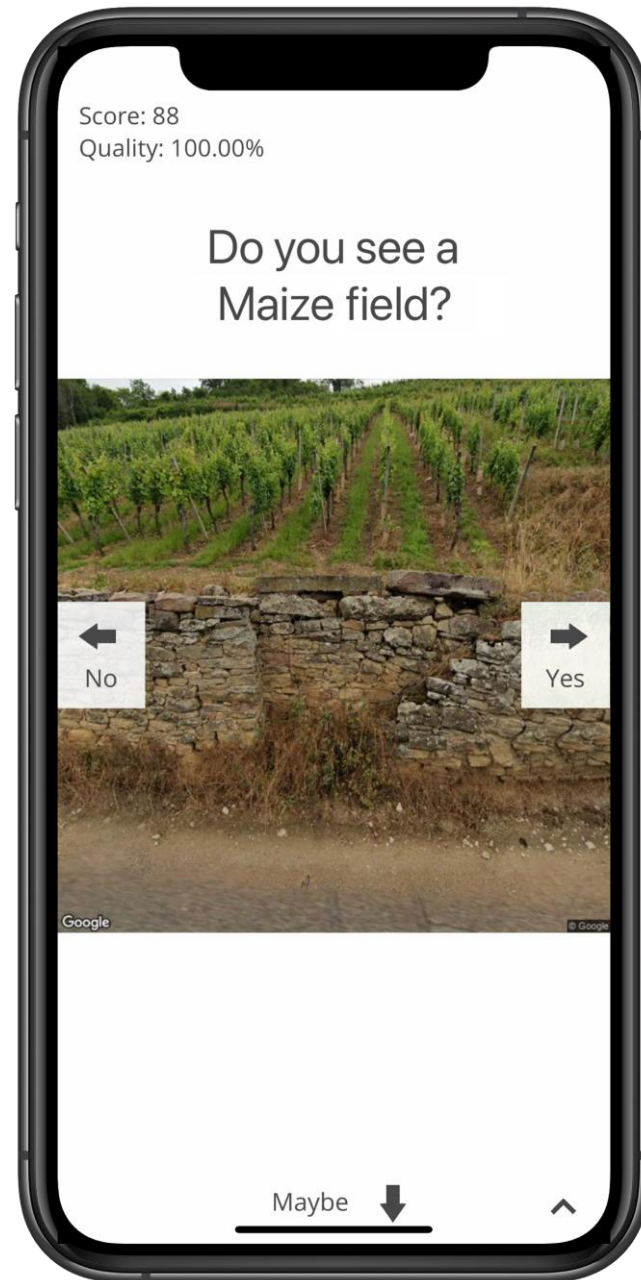
[www.picturepile.org](http://www.picturepile.org)

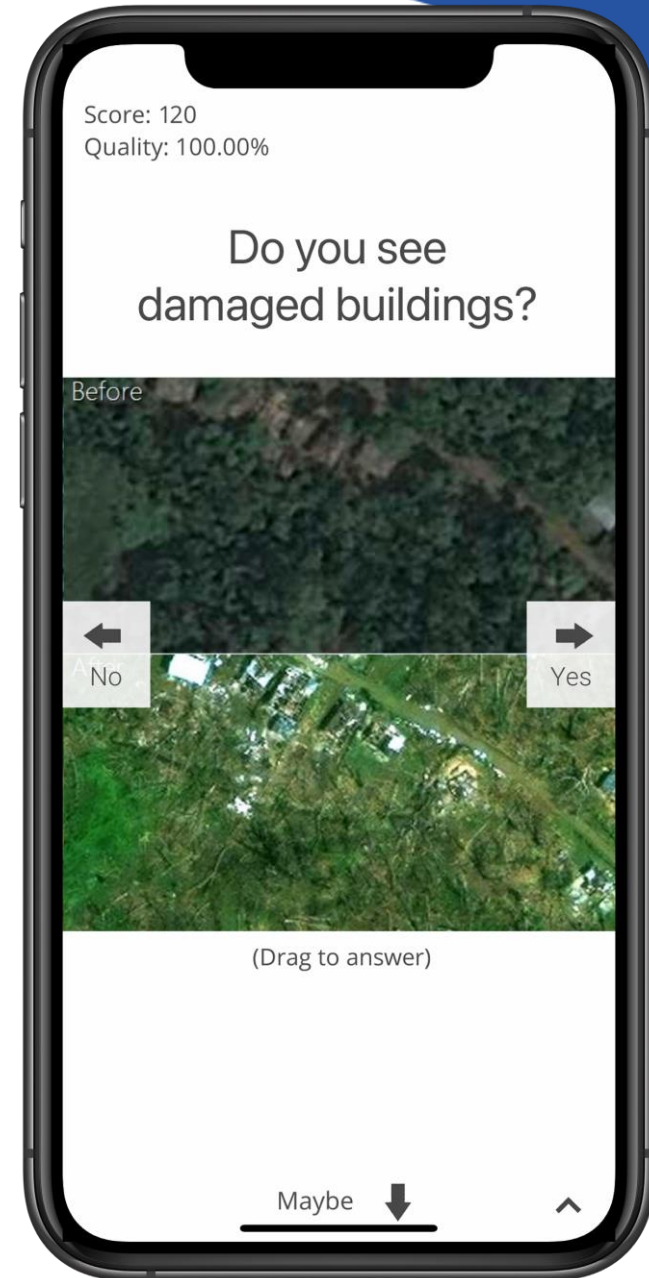
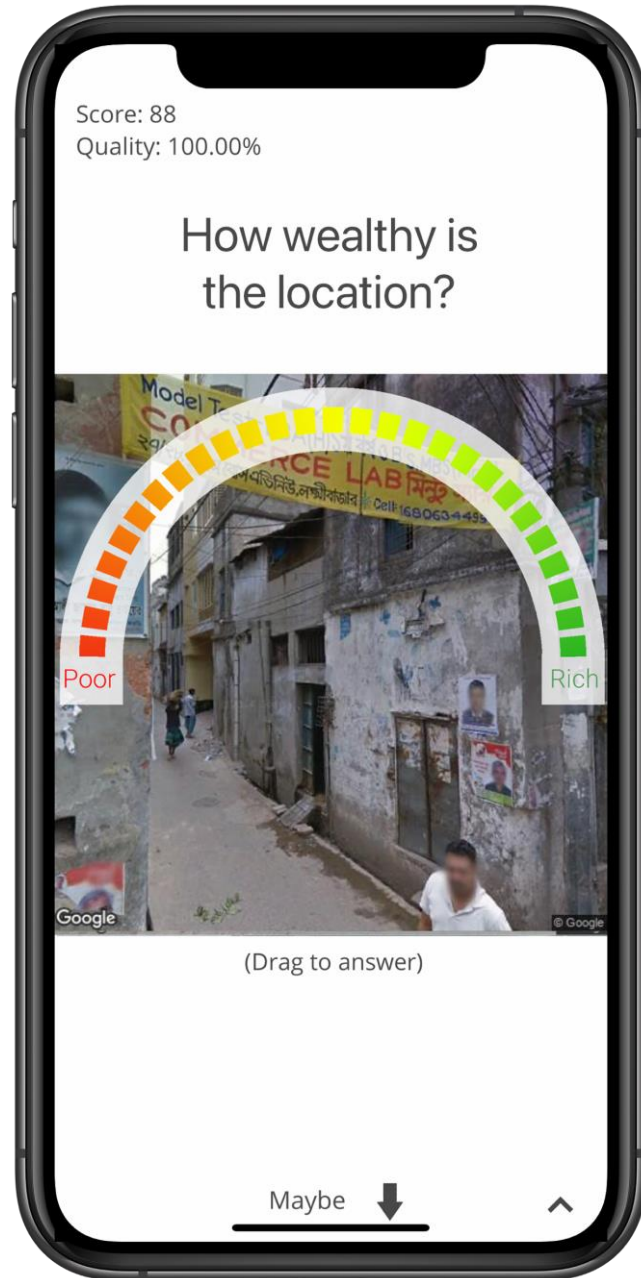
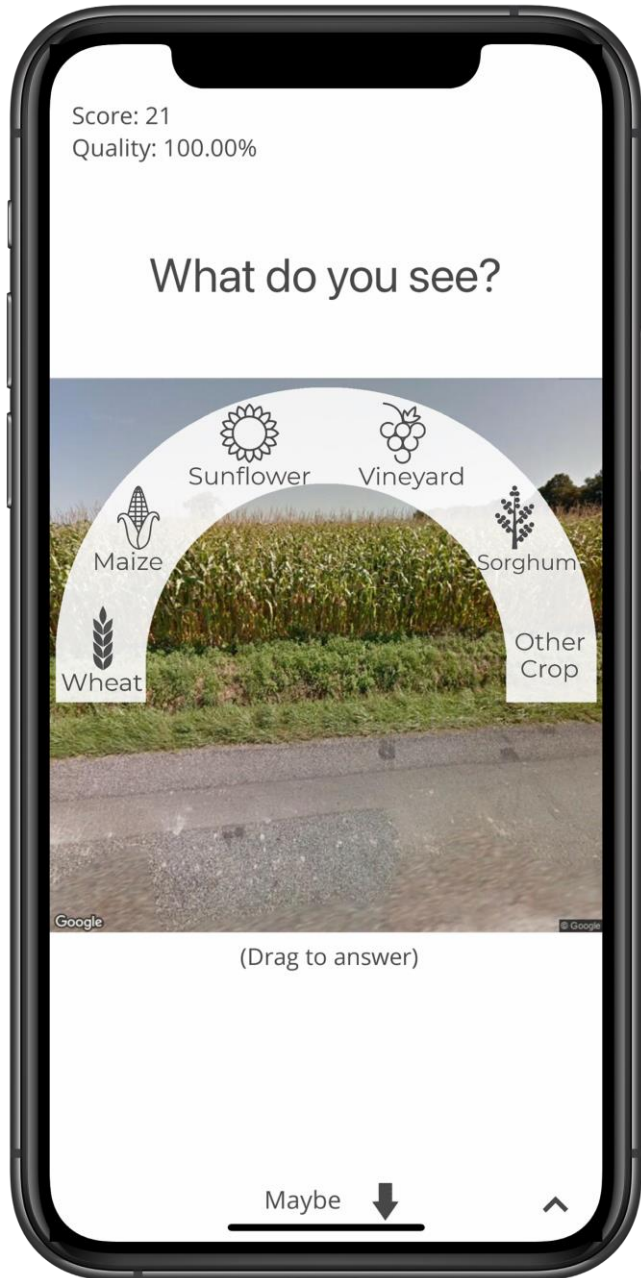




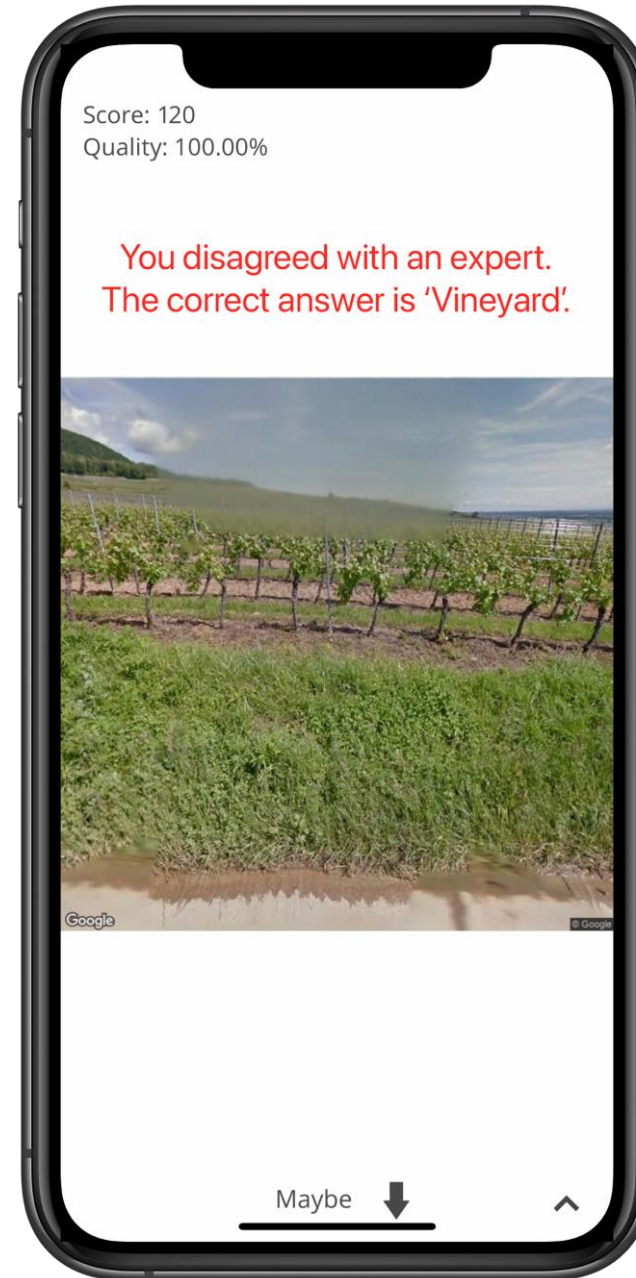
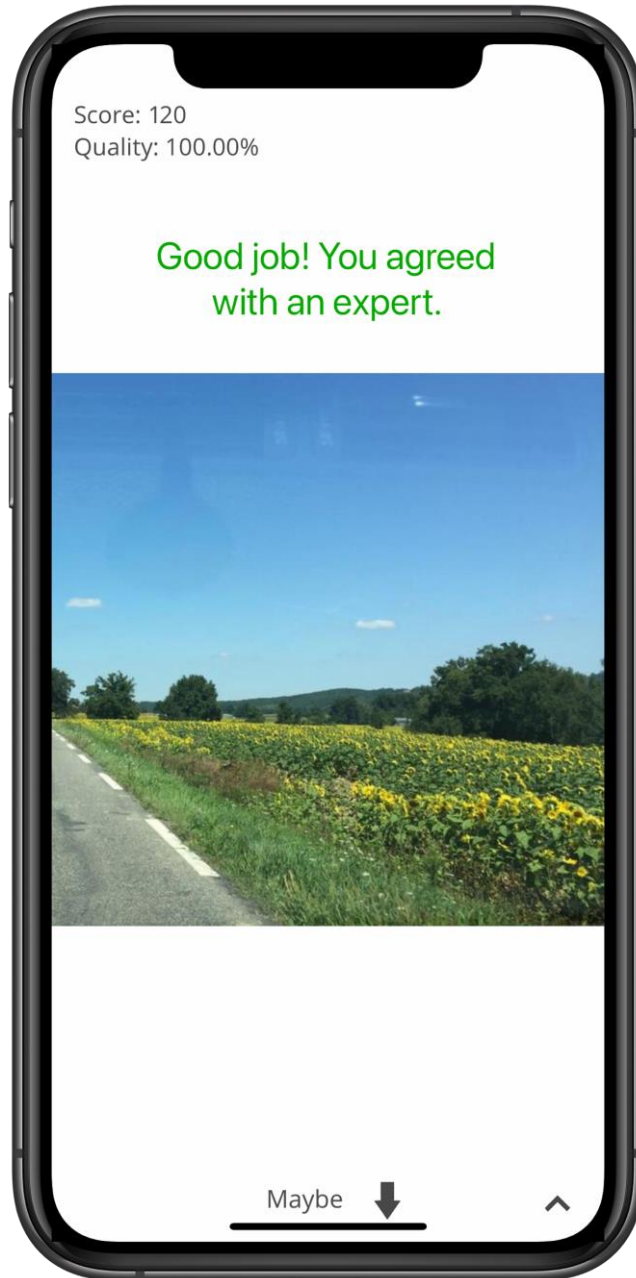


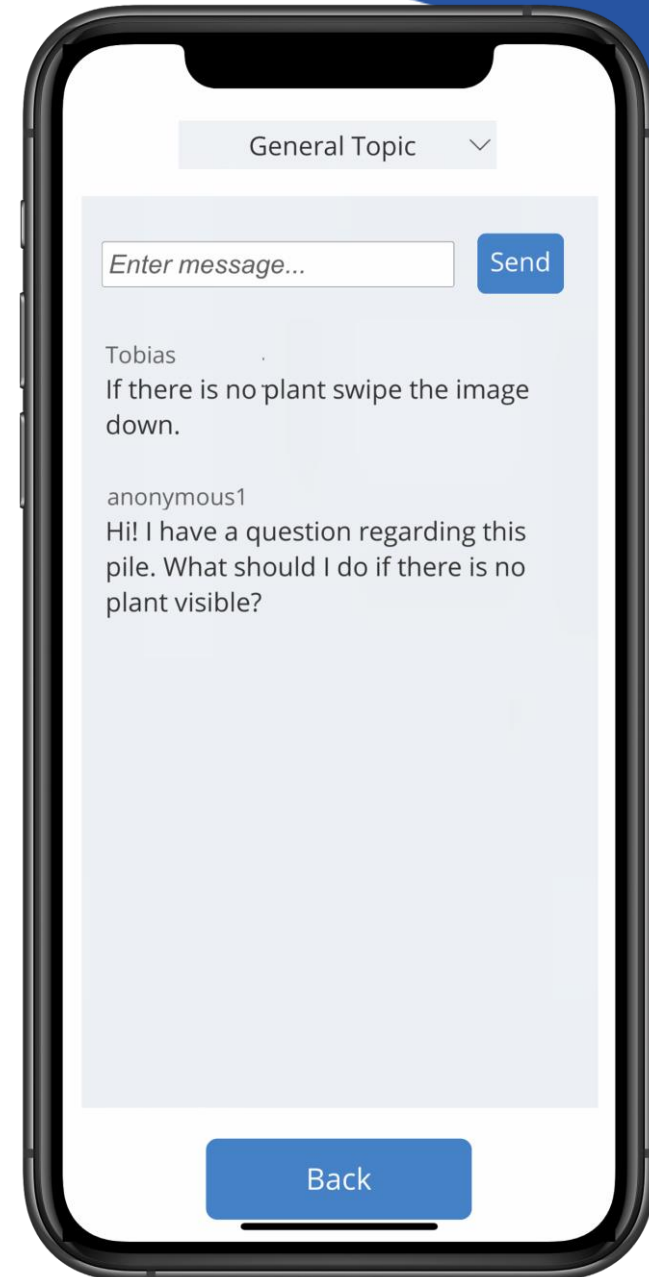
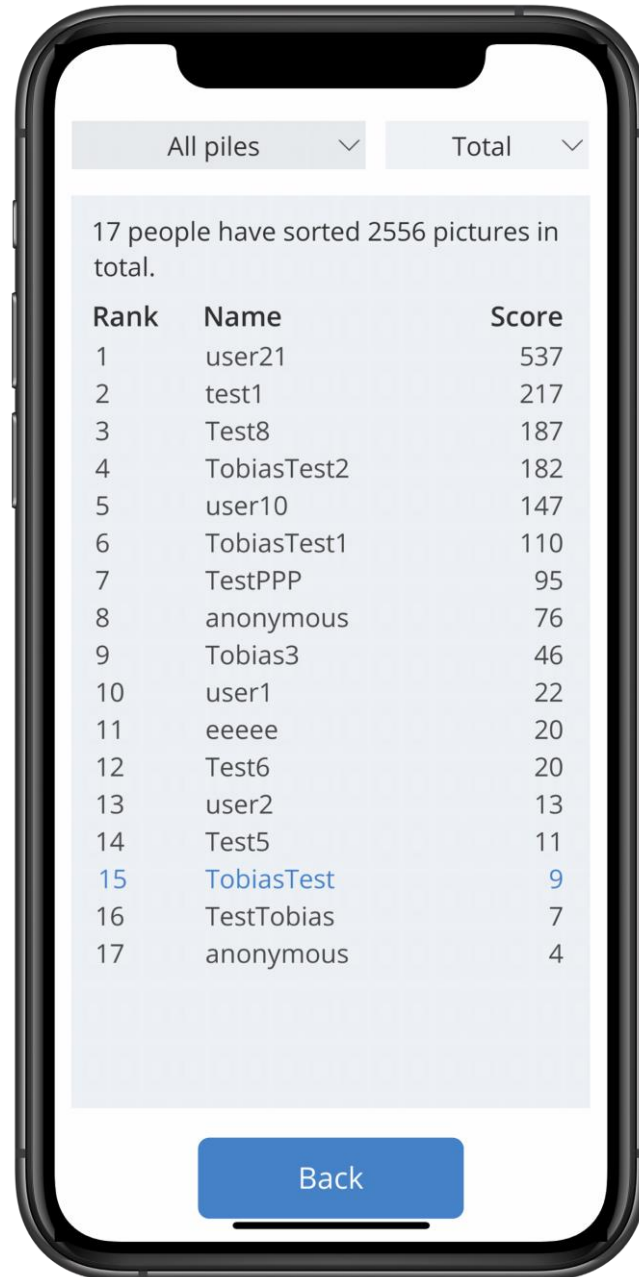
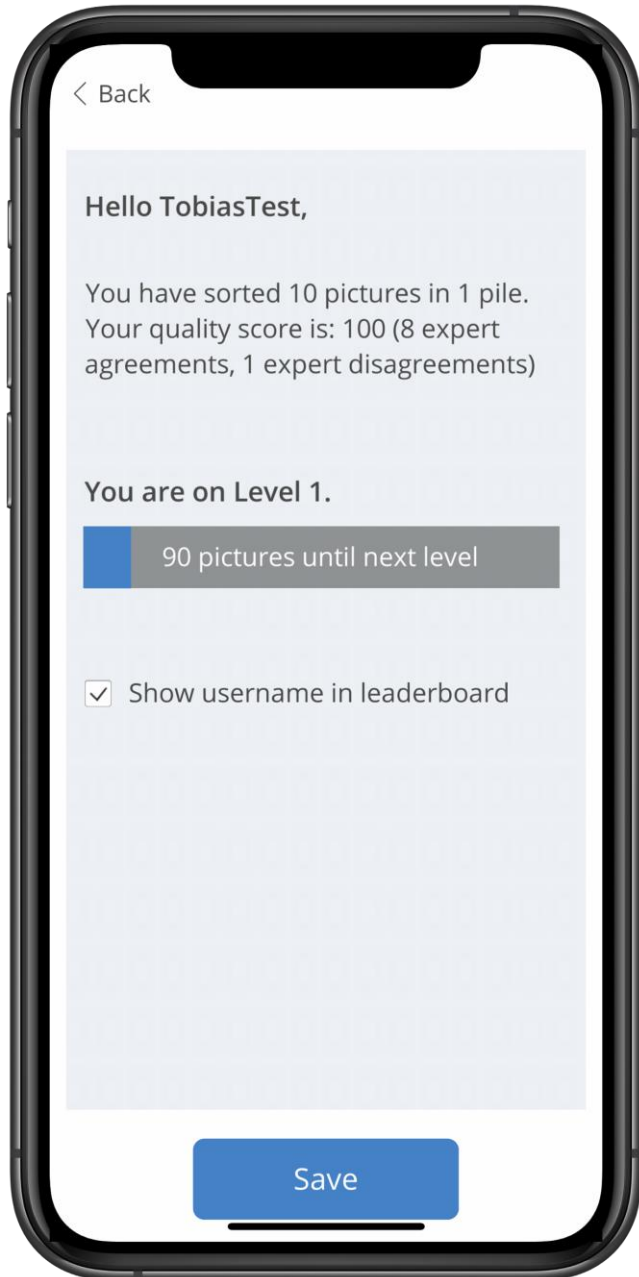






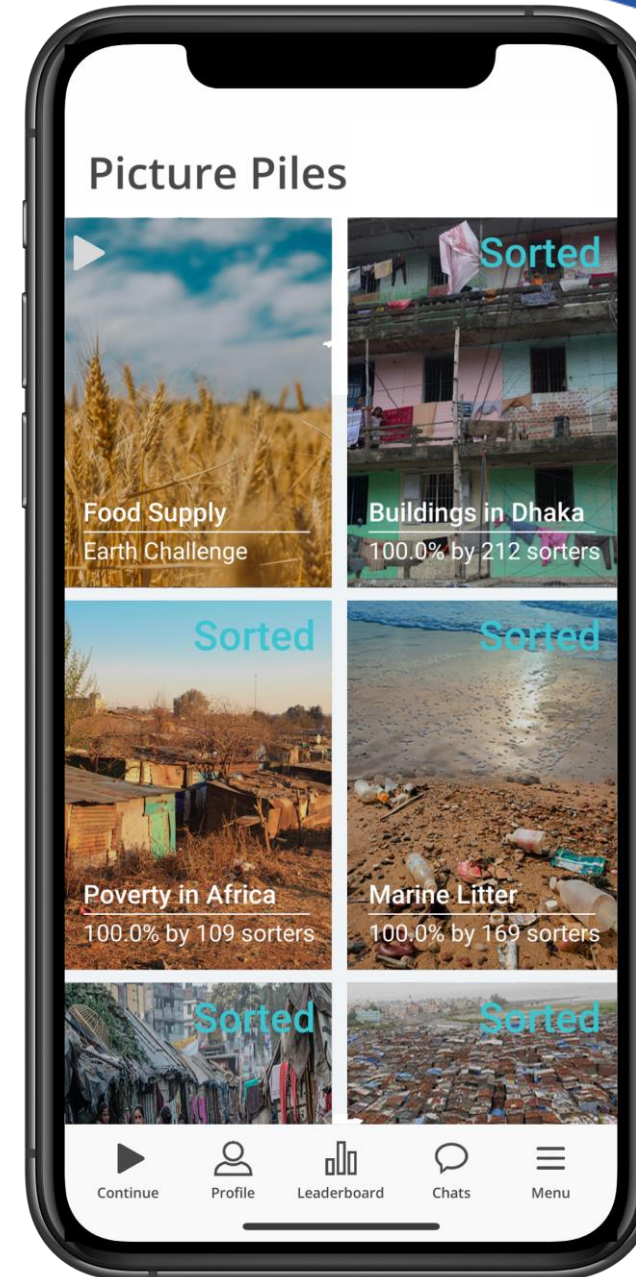






# Picture Pile Campaigns

- Since 2014 we have run 16 different Picture Pile crowdsourcing campaigns
- More than 4000 volunteers participated
- More than 11.5 million pictures have been classified



# Picture Pile Campaigns

Campaign	Location	# of participants	# of validations	# of images	Campaign start date	Campaign available for
Wild landscapes	Global	32	11,937	86,176	2014-12-15	6 months
Deforestation	Tanzania, Indonesia	1360	5,127,697	362,544	2015-07-25	Left open until 2018-09-04
Hurricane Matthew campaign 1	Haiti	344	224,214	37,582	2017-04-28	6 days
Hurricane Matthew campaign 2	Haiti	421	298,323	37,582	2017-05-03	12 days
Cloud detection	Global	149	276,068	27,021	2019-02-28	2 months
Nighttime lights	Global	217	160,338	13,966	2019-03-04	6 months
Urundata land cover campaigns	Indonesia	395	1,373,840	14,221	2019-04-01	4 months
Oil palm plantations	Global	78	56,212	1,649	2019-07-31	1 month
Oil palm plantations Asia	Asia	78	99,618	13,653	2019-08-20	2 months
Poverty (degree of wealth)	Dhaka, Bangladesh	176	60,382	11,300	2019-08-26	6 months
Slums	Dhaka, Bangladesh	74	13,636	30,028	2019-08-27	6 months
Urundata Change Campaigns	Indonesia	195	3,553,315	153,115	2019-08-27	3 months
Marine litter	One beach	105	14,374	1,215	2019-12-13	3 months
Poverty (degree of wealth)	Africa	63	7,888	1,398	2019-12-18	6 months
Poverty (building height)	Dhaka, Bangladesh	181	36,430	12,300	2020-02-06	6 months
Earth Challenge Food Insecurity (crop types) from present	France, Latvia, USA	1292	289,553	45377 out of 70,520	2020-07-28	Ongoing

Source: Fraisl et al. (2022) <https://www.sciencedirect.com/science/article/pii/S1462901121003208>

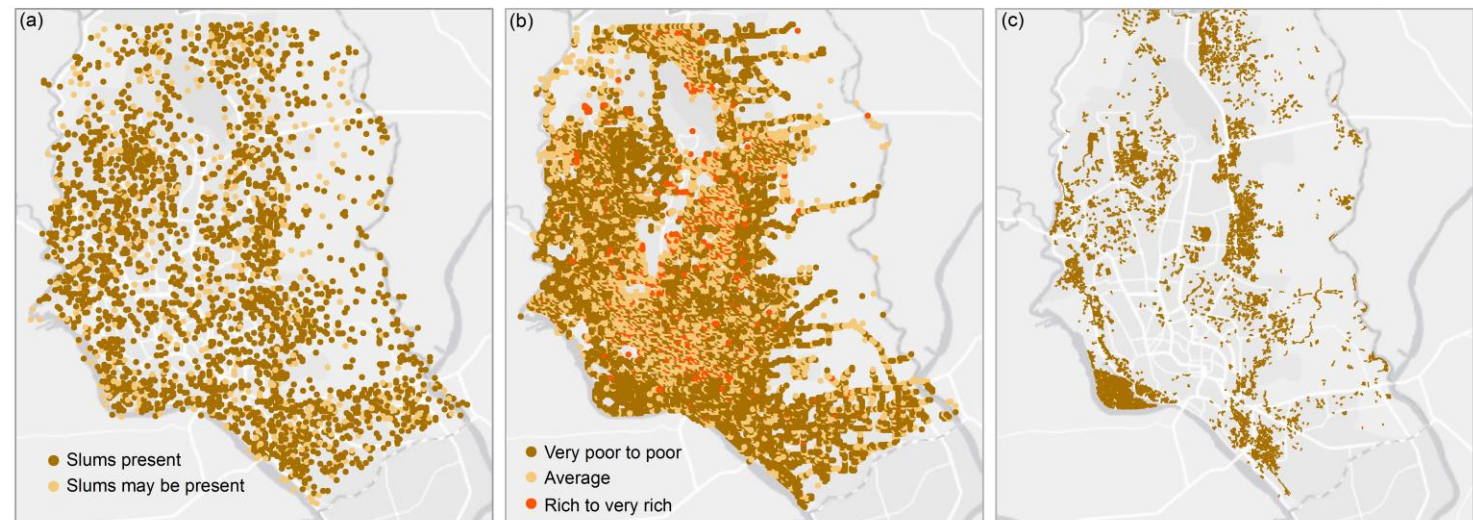
# Picture Pile and the SDGs

- Found that Picture Pile could contribute to the monitoring of 15 SDG indicators (SDGs 1, 2, 11, 13, 14, 15)
- Direct = data from Picture Pile could contribute to the calculation of the SDG indicators
- Supplementary = data that are useful to contextualize an SDG indicator or target

Campaign	SDG contribution by indicator	
	Direct	Supplementary
Wild landscapes	-	-
Deforestation	15.2.1	-
Hurricane Matthew campaign 1	1.5.2, 11.5.2	1.5.1, 11.5.1, 13.1.1
Hurricane Matthew campaign 2	1.5.2, 11.5.2	1.5.1, 11.5.1, 13.1.1
Cloud detection	-	-
Nighttime lights	11.3.1	1.1.1, 1.2.1, 1.2.2
Urundata land cover campaigns	15.1.1, 15.2.1, 15.4.2	-
Oil palm plantations	15.1.1, 15.2.1, 15.4.2	-
Oil palm plantations Asia	15.1.1, 15.2.1, 15.4.2	-
Poverty (degree of wealth)	11.1.1	1.1.1, 1.2.1, 1.2.2
Slums	11.1.1	-
Urundata Change Campaigns	15.1.1, 15.2.1, 15.4.2	-
Marine litter		14.1.1b
Poverty (degree of wealth)	11.1.1	1.1.1, 1.2.1, 1.2.2
Poverty (building height)	11.1.1	1.1.1, 1.2.1, 1.2.2
Earth Challenge Food Insecurity (crop types) from 31 Mar 2021	2.4.1	-

# One example of Picture Pile for SDG 11

- SDG 11, indicators 11.1.1: Proportion of urban population living in slums, informal settlements or inadequate housing
- Slums have multiple dimensions, but one is about housing durability
- Picture Pile was used to classify images in Dhaka for presence/absence of slums, number of floors in buildings and degree of wealth (although clearly subjective)
- Inputs were used (along with many other features including those from remote sensing) to produce a wall-to-wall map for the city with slum locations



Data from Picture Pile

Slum locations from Gruebner et al. (2014)

# Picture Pile Platform

- Picture Pile Platform, new project funded by ERC Proof of Concept
- Commercially self-sustaining platform
- Anyone can setup a pile and run their own campaigns via the Picture Pile Campaigner for free
- Users can earn money
- Data freely available on the Picture Pile Data Portal

## Campaigner

Setup your own pile of images to get classifications

## Picture Pile App

Crowd classifies the images using the picture pile mobile app in an intuitive, efficient and engaging way

## Data Portal

The image classifications are made publicly available on Data portal

## Quality Assurance

Many quality control mechanism guarantee the quality of data collected.


## Free To Use

Its is completely free to setup you own pictures. You can pay the crowd if you don't want to make the collected data public on Data Portal or provide additional incentives for the crowd to do classifications.

# Fair Platform

- Pile creation for free:
  - Data will be made publicly available on the Data Portal
- Payment of a fixed price based on pile size:
  - Users earn at least the minimum wage
  - Share paid to the platform to being able to operate it
  - Option to make data collected private


[Picture Pile](#)
[My Piles](#)
[Create Pile](#)
[Data Portal](#)

 TobiasTest

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[Pile Information](#)
[Training](#)
[Control Points](#)
[Input](#)
[Invite](#)
[Publish](#)
Create New

**General Information**  
Specify general information about the pile like the name, logo, monetary type, sort type and sort question. The sort question will be shown to users during image sorting.



<b>Name</b>		<b>Status</b>	
Building		Collecting Expert Validation	
<b>Monetary</b>		<b>Priority</b>	
Free		0	
<b>Total Images</b>		<b>Sorted Images</b>	
125		0	
<b>Users</b>		<b>Data Status</b>	
6		Data In Portal	

**Logo Image**

  
[Upload image](#)  
 or drag and drop .jpg.png  
 file up to 5Mb

**Name**

**Monetary Type**

**Sorting Type**

**Sorting Question**

[Save](#)



Picture Pile Platform will launch end of 2022

Do you have ideas for our first piles? [Get in touch!](#)

Thank you for your time!  
Tobias Sturn ([sturn@iiasa.ac.at](mailto:sturn@iiasa.ac.at))

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