# Remote sensing with crowd-sense

Can we benefit from remote monitoring of environmental resources through local knowledge and crowd-sensing?

Rohan Jaguste

# Working with ideas that concern individuals, society and the environment

Industrial design for the developing world using in-situ knowhow and resources, commercialising space technology for the benefit of society (ESA's Down to Earth initiative)

# “When an elder dies, a library burns.”

Untapped information, knowledge and wisdom of the environment from indigenous communities, who often inhabit the remotest regions on earth.

# Indigenous communities are usually the first point of impact

Due to their close proximity to nature, small deviations in climatic patterns immediately affect the quality of life and livelihood of indigenous communities in remote regions

# Indigenous communities develop innate sense for dealing with changes to their environment

Local knowledge is paramount to the survival of indigenous communities

# Can our understanding of the environment significantly benefit from this local knowledge?

Yes

# Resolution of the acquired data

Can the accuracy and reliability of data acquired through remote sensing be improved using the human resolution?

# Availability of sensing tools and field experts

Can crowdsensing (using integrated sensors in mobile devices) reliably compliment the capabilities of technical remote sensing tools and field experts?

# Retrieving local knowledge

Can mobile applications enable participatory learning and action?

# Scientific merit of local knowledge

Can machine learning extract valuable data from local knowledge?

# Galaxy Zoo

Crowdsourced classification of galaxies: **www.zooniverse.org/projects/zookeeper/galaxy-zoo/**
See also Denison Olmsted, an astronomer who collected observations of a meteor shower from common people to further develop theories about meteor showers

# CAPTCHA and reCAPTCHA

Crowdsourced image identification and digitisation of books: **web.archive.org/web/20100611210259/http://recaptcha.net/aboutus.html**

# 13 Prospective model


local knowledge and technical capabilities of sensor enabled mobile devices

more reliable results and understanding of changes to the environment

# Designing products and services for acquiring and processing remote and crowd-sensed data

User friendly and participatory applications for general as well as indigenous populations that integrate with remote sensing and GIS tools

# Designing businesses for acquiring and processing remote and crowd-sensed data

Sustainable business of data acquisition and verification using space 4.0 and gig-economy

# 16 Further information and references

**JAHA. People centric business design**
people@gojaha.com

Rohan Jaguste
+46 76-817 86 94

1. **Local people's knowledge in natural resources research**, Warburton H. and Martin A., Natural Resources Institute, The University of Greenwich, 1999
2. http://www.snowchange.org
3. https://www.ey.com/en_gl/tax/how-the-gig-economy-is-changing-the-workforce
4. Referenced topics – crowdsourcing, crowd-sensing, participatory GIS, ethnoecology