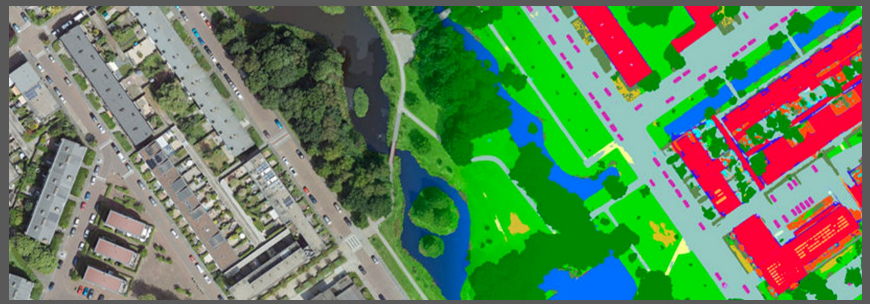
The Alan Turing Institute

Remote Sensing reading group



Thijs van der Plas
Varun Chhabra

25 April 2024

Agenda

- Introductions
- Motivation for this reading group
- *Putting the A & I in Aerial Imagery*
- Planning future sessions

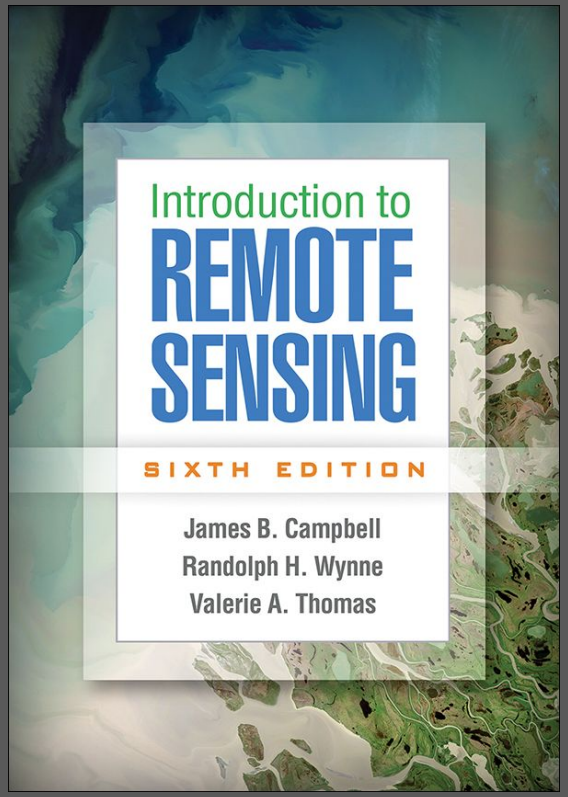
What is remote sensing?

Data (analysis) of earth surface obtained by remote sensors (satellite, aeroplane, drone, ..).

Geo-referenced images, videos, point clouds, points, time series, ..

Often includes other geospatial data.

Increasingly analysed with AI/ML.



Why we should meet

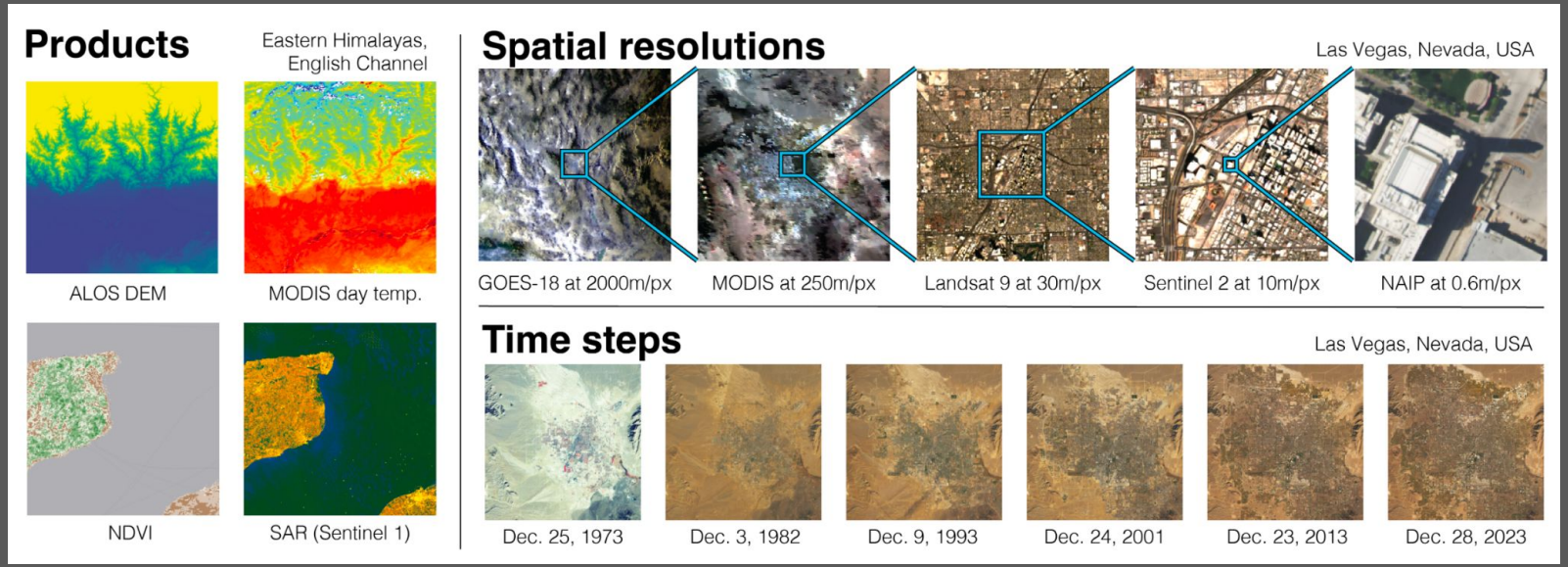
Mission critical! ML is about more than cats and dogs!

arXiv:2402.01444 (cs)

[Submitted on 2 Feb 2024]

Mission Critical -- Satellite Data is a Distinct Modality in Machine Learning

Esther Rolf, Konstantin Klemmer, Caleb Robinson, Hannah Kerner



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Remote sensing data is used across many different domains (in Turing).

Increasing attention for AI in remote sensing community (and vice versa?)

arXiv:2305.08413 (cs)

[Submitted on 15 May 2023]

Artificial intelligence to advance Earth observation: a perspective

Devis Tuia, Konrad Schindler, Begüm Demir, Gustau Camps-Valls, Xiao Xiang Zhu, Mrinalini Kochupillai, Sašo Džeroski, Jan N. van Rijn, Holger H. Hoos, Fabio Del Frate, Mihai Datcu, Jorge-Arnulfo Quiané-Ruiz, Volker Markl, Bertrand Le Saux, Rochelle Schneider

satellite-image-deep-learning

Goals of this reading group

Connect RS Turing researchers across domains/programmes.

Platform to present work and get feedback/suggestions from outside your direct team.

Stay up-to-date with latest literature and methods.

Putting the A & I in Aerial Imagery

SAR pre-processing/image reconstruction (many different techniques)

Background on RS data/photogram.

Image/data fusion

Best practices/tools when using RS data

Different resolutions data/scale-invariant processing

Domain adaptation/transfer learning [locations / modalities / providers]

Efficient use of time series + gappy data handling

Foundation models (self-supervised)

Suggested format

- Bi-weekly meetings
- One presentation on paper or topic (30 mins) + round-table (30 mins)
- Start with foundational papers, before moving on to latest techniques?
- Volunteers? :)
- Github with shared materials (slides/papers/..)