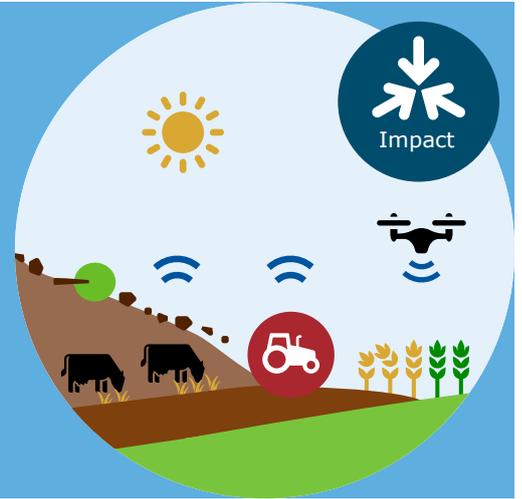


Turing meets Turing

Dryland vegetation pattern model discovery

Emerging DS/AI methods



Data Driven Discoveries in a changing climate (D3C2)

Objective: Use remote sensing data to discover the best mathematical model, which in turn can be used to predict, prevent and reverse dryland ecosystem degradation.

Activities and results

What did you do?

- Monthly meetings.
- Joint research.

What did you achieve? What have you celebrated? Was there an approach that failed, and why?

- The original research idea relied on the technical expertise of the main applicant, which could not be easily transferred to other project members within the time frame. To integrate the skills and interests of all project members we instead chose to structure the project into multiple strongly related lines of research.
- We managed to prove that we can have a successful collaboration between Biometris and GRS based on the implementation on AI for analysis of spatial vegetation patterns; we are very happy with this incentive to start working together.

What is your outlook with this research?

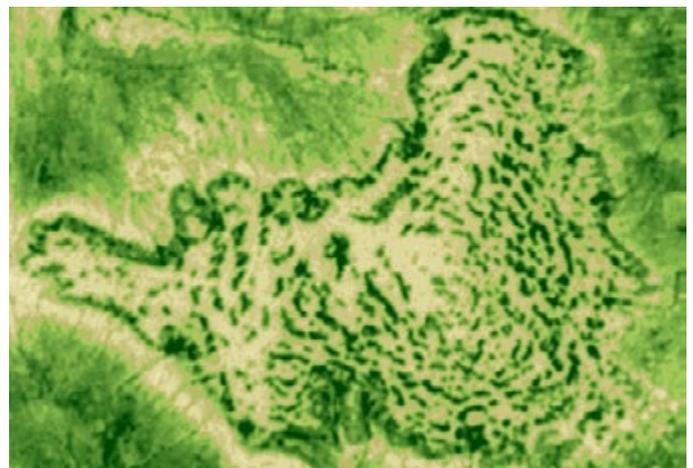
- The spinoff project "Physics-Informed Neural Networks for predicting pattern formation of dryland vegetation" was granted a Wildcard for 2022-2023: the new research line between Biometris and GRS will be continued.
- We have connected with the WDCC Fellowship project "Global Detection of Resilience Loss based on Turing Patterns using Remote Sensing Data and AI" (Ingrid van de Leemput, Marten Scheffer, Ricardo Torres da Silva), which I'm confident will lead to synergy.
- We take part in (and fit well within) the WUR SciML Network.

Deliverables

- Manuscript titled "Physics-Informed Neural Networks for predicting pattern formation of dryland vegetation" (to be made ready for publication)
- Manuscript titled "Skewness of the stochastic Busse balloon" (to be made ready for publication)

Lessons learned

We have established a new AI collaboration within the PE&RC research theme group Data and Engineering Science. The direct AI approach suggested by GRS (which was not explicitly in the proposal) works better than (I) expected, complementing the more indirect AI approach proposed by Biometris.



Contact



Eric Siero

Assistant professor (project manager)

eric.siero@wur.nl

Wageningen University & Research
P.O. Box 47
6700 AB Wageningen
The Netherlands
T +31 317 48 07 00
www.wur.eu

Project members

Eric Siero

Jens van der Zee

Christian Hamster

Diego Marcos Gonzalez

Lammert Kooistra

Peter van Heijster
