Thesis topic: end-to-end methods for map fault delineation detection on remote-sensing data.

Geronimo.AI is a start-up in Delft and is the Dutch front runner in applying artificial intelligence to remote sensing data. We aim to fully automate geographical map updates in the coming years using aerial and satellite images. To get there, we are continuously improving our algorithms and keeping up with the state of the art in machine learning.

Topic of the thesis

One of our products uses automatic map fault detection, i.e. finding discrepancies between an aerial image and a map. For example, if the map contains buildings, we want to have accurate delineations of all the buildings (or parts of buildings) that are missing in the map. Our current solution uses 2 steps to find delineation of map faults:

1. Semantic segmentation is performed with a U-net to predict 'blobs' of map faults. The U-net uses an aerial image and a reference map as input.
2. The 'blobs' of map faults are polygonised using a traditional raster-to-vector method.

The second step adds noise to the final delineations. In addition, it adds extra complexity and causes computational overhead. Therefore, we would like to move to an end-to-end method that directly predicts map fault delineations from aerial imagery input. Related research on building footprint delineation detection exists[1][2]. However, to our knowledge a method for direct detection of map fault polygons based on remote-sensing data does not yet exist.

WHAT WE VALUE

- People who enjoy tinkering and building solutions, from drones to AI.
- Being passionate about the state of the art in machine learning
- Being able to accept criticism and challenge solutions or ideas of others.
- Being a team player.

YOU HAVE EXPERIENCE WITH

- Deep learning
- Python, or willing to learn python
- Numerical libraries such as numpy

[1] https://arxiv.org/abs/2111.15491,

[2] https://arxiv.org/abs/2004.14875

- Preferably deep learning libraries, such as Tensorflow or Pytorch

WE OFFER

- Young team, big impact, exciting start-up life
- Integration with our experienced machine learning team
- Access to high end computing hardware
- Office in Delft with a stunning view and incredible lunches
- Joy in and outside of the office
- €500 monthly compensation

INTERESTED?

Send an email with your motivation and CV to career@geronimo.ai. For more information, visit https://geronimo.ai