Building footprint detection in satellite imagery using deep learning and image segmentation

Welcome to ICube,

Created in 2013, the laboratory brings together researchers from the University of Strasbourg, the CNRS (French National Center for Scientific Research), the ENGEES and INSA of Strasbourg in the fields of engineering and computer science, with imaging as the unifying theme.

With around 650 members, ICube is a major driving force for research in Strasbourg whose main areas of application are biomedical engineering and sustainable development.
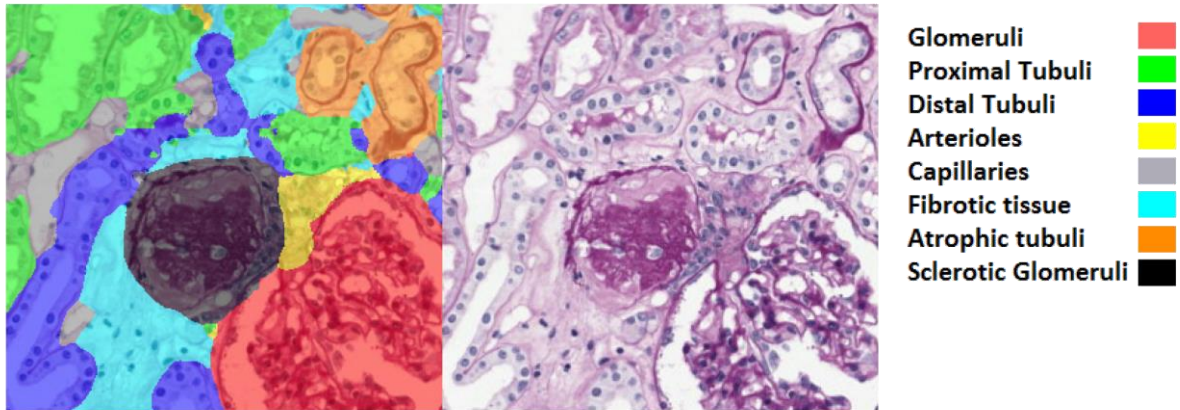
SERTIT, a service platform of ICube, known for its ISO certified rapid mapping service, is seeking to accelerate its mapping activities through artificial intelligence. This service assists in post-crisis emergency management (e.g. ground rescue, reconstruction efforts …).

You will join a transversal team of researchers, software engineers and geomatics specialists from SERTIT (*Regional service for remote sensing and image processing*), SDC (*Data science and knowledge*), IMAGeS (*Images, learning, geometry and statistics)*, working on automatic feature extraction from satellite imagery.

Organized horizontally, ICube operates with a people centric approach, which fosters a friendly community and culture. Join us to be part of our mission to put satellite imagery in service of those in need.

Mission

- Users need to map buildings during rapid mapping after a disaster strikes
- Collaborate with research teams to transfer techniques from medical imaging to remote sensing
- Develop new innovative and enhance existing solutions to automatically extract building footprints using:
  - Deep Learning
  - Object based segmentation algorithms

Glomeruli	🟥
Proximal Tubuli	🟩
Distal Tubuli	🟦
Arterioles	🟨
Capillaries	⬜
Fibrotic tissue	🟦
Atrophic tubuli	🟧
Sclerotic Glomeruli	⬛

o A combination of the above

Role

- Build object based segmentation algorithms for satellite image processing
- Integrate deep learning models with object based segmentation algorithms for feature extraction from imagery
- Implement efficient solutions for processing raster and vector geographic data
- Participate in a research and development team

Skills

Must have:

- Experience with the Python scientific computing ecosystem (Pandas, numpy, scikit-learn, scikit-image, etc.)

- Knowledge of Machine Learning workflows and techniques (e.g. best practices around training data management, understand basics of numerical optimization)
- Familiarity with Linux environments
- Have excellent communication skills and a strong team player
- Good knowledge of English, French is not mandatory
- Can-do attitude!

Nice to have or interested in learning:

- Experience with GIS software and packages like ArcGIS, QGIS, GDAL or PostGIS
- Experience with a deep learning framework (Tensorflow, PyTorch, Caffe, Theano, Keras)
- Experience with remote sensing and/or geographic raster/vector data

Profile

- Undergraduate student of a computer science/geomatics degree or similar

Benefits

- Salary: 550 € / month
- In some cases travel expenses (to/from Strasbourg) can be provided
- Access to a state-of-the-art high performance GPU cluster
- Learn cutting edge deep learning research and apply those techniques to real world challenges

Some press about us:

"Presentation of the ICube laboratory" (Youtube video)

Who is SERTIT ? (Youtube video)

Join Us:

To apply, send us an email to iadb@icube.unistra.fr (point of contact: Michal PARUSINSKI and Fahd BENATIA), be sure to include your C.V. and a cover letter to let us know why you think you would be a good fit.

DEADLINE FOR APPLICATION: 13/03/2020

STARTING DATE: To be discussed

LOCATION: Strasbourg, France