Synthetic Aperture Radar (SAR) satellite image analyses for Iceberg detection

The Sentinels are a new fleet of ESA satellites that deliver a wealth of data and imagery that are central to the Europe’s Copernicus programme. Sentinel-1A and Sentinel-1B were launched on 3 April 2014 and 25 April 2016. The Sentinel-1 satellites carry an advanced radar instrument to provide an all-weather, day-and-night supply of imagery of Earth’s surface. The two satellites images the entire Earth every six days. The images are publically available in hope that it enhances research and product development.

Recently several GPS beacons were deployed on icebergs in Baffin Bay. Some of the icebergs tracks can be seen on this webpage: http://yb.tl/icebergs. These icebergs should be used as ground truth in images analyses. The goal of this project is to use images analyses to detect the icebergs on SAR images. The student should compare images with different polarisation and test, which one is best suited to detect icebergs. Further interesting questions are: How high is the success rate of iceberg detection? Does the angle of incidents has influence on the success rate? Can the algorithm distinguish between icebergs and ships? How does sea-ice influence the detection?

In the end of the project, the student will have knowledge about (keywords):

- Image analyses
- Image characterization
- Satellite imagery – SAR images
- Arctic environment – Icebergs, Sea Ice

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