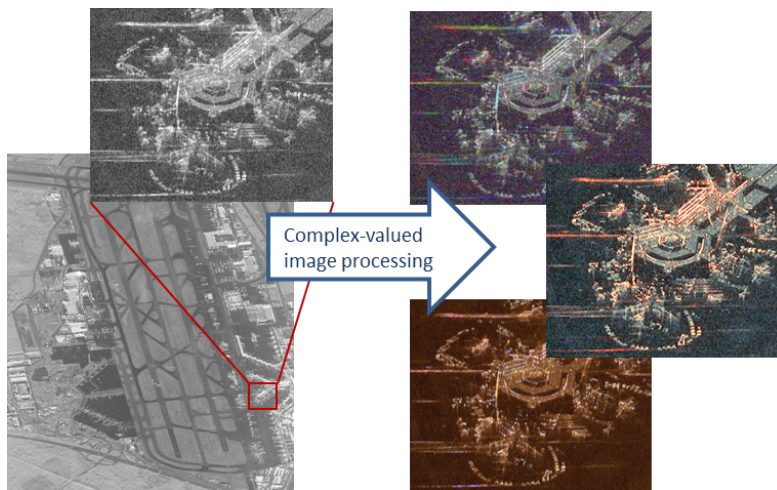# GPU-based image processing on remote sensing radar data

Bachelor or Master Thesis

Topic:

The Microwaves and Radar Institute of the German Aerospace Center (DLR e.V.)[1] contributes to the development and advancement of ground-based, airborne and spaceborne radar sensors. One of the spaceborne missions is the German rsearch satellite TerraSAR-X with a synthetic aperture radar (SAR) on board. Even though this SAR sensor is able to acquire image data with spatial resolutions well below one meter, image analysis is a very challenging task due to specific radar imaging effects. At the Department of Reconnaissance and Security methods are under development to assist image operators specifically in military and security applications. These methods use the complex-valued input data (amplitude and phase) to perform computationally expensive algortihms. The aim of the thesis will be to accelerate the runtime of existing algorithms with GPU-based libraries. The student will get a work contract at DLR for the period of the thesis, which has to be carried out at the Microwaves and Radar Institute in Oberpfaffenhofen (near Munich).

Objective:

- Learn about spaceborne radar imaging
- Get familiar with radar image processing
- Implement GPU-based algorithms

Qualifications:

- Experience in Java
- Experience in C++
- Interest in image processing

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[1]DLR e.V. Microwaces and Radar Institute: www.dlr.de/hr/