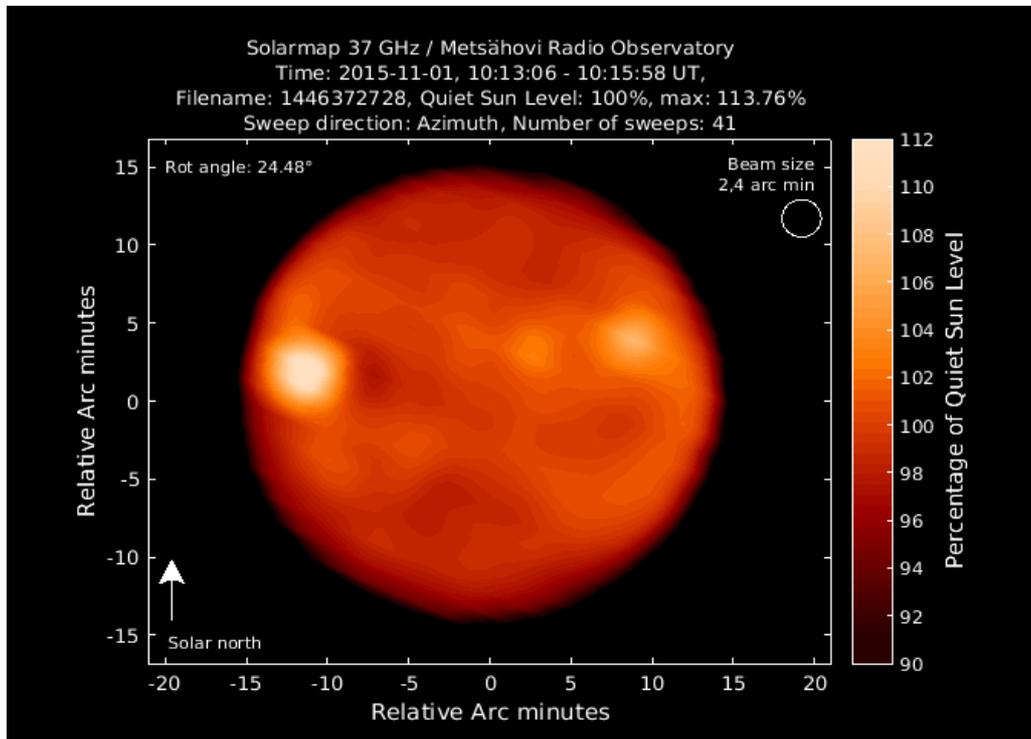# Masters 2 – Listing and categorising solar features from digitised solar radio maps.
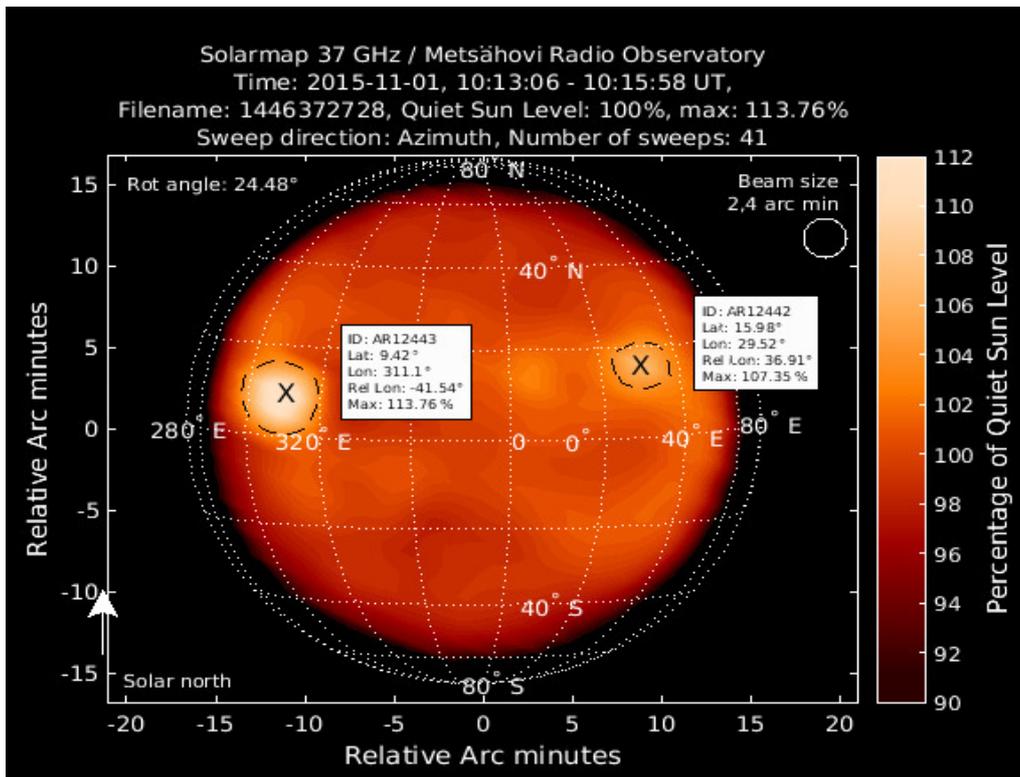
The Department of Computer Science, Aalto University are seeking applicants for a Masters' project to commence immediately to support the Metsähovi Observatory based in the School of Electrical Engineering.

We seek a suitably qualified candidate to program the automation of the processing 2D data in two (or subsequent to our related Masters 1, three) digital formats, to identify and classify sunspots (see the example images). Our objective is to identify bright regions, recording their time of appearance, position (longitude and latitude), shape, size, structures, intensity, spot number ID (uniqueness), and time of disappearance. We will also need to be able to identify and account for atmospheric interference effects. Given the variety of formats, and the necessity to account for changes in atmosphere, and overall brightness, the adoption of machine learning techniques may be desirable.

Having effectively accumulated the data we wish to understand how surface intensity varies over time or with changes in magnetic activity. The candidate will be responsible for adapting existing tools, developing new tools or identifying new tools that can be developed.

It is probable that these tools and skills will be transferable to many other applications, so should be of interest to the community outside astronomy and for other computer science applications.

The project will suit a candidate with programming experience, familiarity with python, and an interest in machine learning. There will be a requirement to visit the Metsähovi Observatory at least weekly, where the co-supervisor Dr. Juha Kallunki is based. The other co-supervisors are Dr. Joni Tammi (Metsähovi, director), Dr. Frederick Gent (ReSoLVE Center of Excellence). A supervisor suited to the successful candidate will be included from Computer Science.

Applicants should apply to frederick.gent@aalto.fi, with a brief summary of your relevant experience and qualifications. Questions relating to the project may be directed to Dr. Tammi or Dr. Gent.