Open PhD position in Universitat de València, Spain

Project: DACE: Detection of Anomalous Changes and Extreme Events in Earth Observation Data
Advisor: Prof. Dr. Gustau Camps-Valls and Luis Gómez-Chova

Summary of activities. Earth observation data allows us to detect anomalous changes on the land-cover, as well as extreme events, both spatially explicit and time-resolved. This is now possible by exploiting high resolution satellite images and long time series of images and products, along with powerful statistical techniques to process them. However, in recent years, the big and heterogeneous data streams acquired by satellite constellations hamper the adoption of advanced machine learning statistical techniques for anomaly change detection and extremes identification. This project proposes to develop, characterize, and apply novel anomaly (change) detectors under the framework of kernel methods. Kernel machines are a proper framework to develop online detection algorithms, to accommodate multi-source data, model complex distributions, to cope with high-dimensional data, and can be engineered to the particular EO signal characteristics.

We will advance in theoretical aspects of the problem by developing a novel kernel framework for extreme events and anomaly change detection that can be online, generalizes extreme value theory, deals with non-Gaussianity and invariances. A prototype of the best performing method will be implemented at the Google Earth Engine (GEE) framework. Algorithms will work at both local and global planetary scales, using very high resolution (VHR) imagery and multi-decadal global carbon products. Detection of rare, unexpected changes and events under the developed statistical framework will constitute the stepping stone before the more ambitious far-end goal of machine attribution of anthropogenic climate change causes.

Where? The successful applicant will be based in València, Spain, and will pursue his/her PhD in the Image Processing Laboratory (IPL) of the Universitat de València, http://isp.uv.es. Supervision will be done by Profs. Gustau Camps-Valls and Luis Gómez-Chova.

Who?
- Applicants must have completed a master's degree in Mathematics, Physics, Computer Science, Earth/Environmental Sciences, or Electrical Engineering.
- Additional expertise in remote sensing, climate science and image processing is highly valuable.
- Excellent coding skills (in Python, Matlab, R, and eventually Java/C++) is an asset.
- A good standard of written and spoken English is required.
- Are you highly motivated, enthusiastic and with passion for quantitative science to join our team?
- The position may start as of June 1, 2016 (or as soon as possible thereafter) and is limited to 3 years.
- Salary is according to the UV regulation for PhD salaries (around 1400€/month gross + 1600€/year for travel/accommodation). València's cost of living index is 55.
- **Important note:** Master's degree obtained after Jan-2013 and earned in a non-Spanish university.

What? Please send your application as one single PDF file (2-pages CV and 2 recommendation letters) to Gustau.Camps@uv.es, indicating in the email's subject «Grisolia-2016».

When? Send the dossier no later than **March 4, 2016.**

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