

## ***Automated analysis of deep-sea cabled observatory video data***

### **Presenters:**

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### **Purpose of the workshop:**

The aim of this workshop is to inspire interdisciplinary research in the area of automated analysis of deep-sea video data. Data from the NEPTUNE Canada cabled observatory will be used to illustrate representative examples of research problems in the field.

### **Description:**

The NEPTUNE Canada cabled observatory has been actively collecting real-time data since 2009, which can be used to study the physical, chemical, geological, and biological oceanographic conditions of the dynamic Earth-ocean system. The backbone of the network consists of an 800 km loop of undersea cable off the west coast of Vancouver Island and Washington State which provides continuous power and high bandwidth real-time communications to hundreds of sensors of different types connected to the network. The data is freely available to researchers worldwide through a web-based interface (<http://www.neptunecanada.ca>). For video data alone, the ever-growing archive contains more than 2.5 TB of video data from cameras ranging in depth from 20 m to 2200 m.

The first part of this workshop will introduce the participants to the NEPTUNE Canada data tools, including the data search interface, a data plotting utility, and the deep-sea video archive. Participants are encouraged to bring a laptop to interactively experiment with the tools.

In the second part, we focus in particular on video data. We will present an overview of the main challenges for computer vision and video processing techniques in underwater imaging applications. These challenges include, but are not limited to:

- light propagation in underwater media (forward and backward scattering, wavelength-dependent attenuation with distance)
- presence of floating particles (marine snow)
- analysis of massive amounts of data (HD videos recorded on a 24/7 basis)

A comprehensive survey of the state-of-art techniques in underwater applications of computer vision will also be presented. Among the techniques to be discussed are object recognition, motion analysis, and video summarization.

The last part of the workshop will be dedicated to discussion and questions from the audience.

**Who should attend:** Anyone with an interest in cabled observatory data, deep-sea video data, computer vision, video processing and/or marine biology. Specialists and non-specialists welcome.