# Scientific Computing

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## CBC Talk on Multi-Scale Imaging and Modeling of the Brain - June 11, 2012

**Dr. Anders Dale is professor of medicine at UCSD and specializes in neuroscience and imaging of the brain.**

Total number of participants: 17
Total number of guests outside of CBC: 5
Number of different nationalities represented: 3
Total number of speakers: 1
Total number of talks: 1

### Multi-scale imaging and modeling of the brain

This talk will give an overview of Dale's famous scientific work, which lies in the intersection of imaging, signal processing, statistical analysis, and medicine. Dale's research is motivated by fundamental clinical questions and has resulted in superior mathematical algorithms that have impacted, e.g., GE's leading imaging equipment and our understanding of Alzheimer's disease. The aim of his visit is to establish a closer collaboration between biomedical modeling groups in Oslo and Professor Dale's laboratory at UCSD. This collaboration includes exchange of master's students, Ph.D. students, postdocs, and senior researchers.

### About the speaker

Dr. Dale is founding Co-Director of the Multimodal Imaging   Laboratory, an interdisciplinary initiative of the Departments of  Neurosciences and Radiology. He is highly skilled in the development and   utilization of multimodality imaging technologies.

Within both departments, Dr. Dale is the designated point person for   integrating the various modes and methods of collecting imaging data,  including functional MRI (fMRI), magnetoencephalography (MEG),   electroencephalography (EEG), and optical imaging. His efforts are   directed in three areas: continuing development and refinement of   accurate and automated algorithms for evaluation subjects using   multimodality approaches to data collection; statistical analysis of data; and conducting studies in animal models using optical imaging,   high field fMRI, and electrophysiological recordings to enhance the  interpretation of neuroimaging studies.

Correct modeling of EEG/MEG and optical signals requires an accurate   segmentation of the tissues within the head. A major component of Dr.  Dale's laboratory effort has been on developing accurate and automated   algorithms for head segmentation. This work began while he was a  graduate student at UCSD and continued with Dr. Bruce Fischl and Dr. Eric Halgren at Harvard Medical School. Efforts to date have resulted in   the development of software tools that enable the automated  segmentation of the entire head and brain, including the neocortex and   subcortical structures, from MRI data. As Dr. Dale notes, "The task of   automated structure segmentation of human brain anatomy has been a Holy   Grail for years."

Investigators at the Multimodal Imaging Lab are currently involved in   several clinical research studies, applying these methods to assessment  of regional morphometric changes associated with normal and abnormal   development, aging, and brain-related diseases such as schizophrenia,   Alzheimer's disease, and Huntington's disease.

 (For Further information, please see  http://en.wikipedia.org/wiki/Anders_Dale_(Neuroscientist)  )

| What | |
|---|---|
| **When** | Jun 11, 2012 from 02:00 PM to 02:45 PM |
| **Where** | Bakrommet @ Simula |
| **Contact Name** | Hans Petter Langtangen |
| **Attendees** | Anders Dale<br>Annik Myhre<br>Are Magnus<br>Fritz Albrigtsen<br>Glenn T. Lines<br>Hans Petter Langtangen<br>Joachim Sundnes<br>Johan Hake<br>Johannes Ring<br>Karen Støverud<br>Kent Andre Mardal<br>Kim Barret<br>Marie Rognes<br>Martin Alnæs<br>Øyvind Evju<br>Sam Wall<br>Xing Cai |
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