CINN Centre for Integrative Neuroscience and Neurodynamics

EPSRC Pioneering research and skills

Data Assimilation Research Centre

University of Reading

Summer School/Creative Workshop

Data Assimilation & Inverse Problems – From *Weather Forecasting* to *Neuroscience*

July 22-26, 2013, University of Reading, United Kingdom

Data Assimilation is concerned with the reconstruction of the state of a dynamical system from measured data. It is usually employed in a cycled way, where data are used to correct or guide the dynamical system step by step, while forecasts are generated on a desired time grid. This is a key ingredient for important applications, for example for Numerical Weather Prediction (NWP) or predictions of Climate Change, but it is also increasingly employed in medical and industrial applications.

The *Summer School and Creative Workshop on Data Assimilation and Inverse Problems* at the University of Reading provides an introduction into the key concepts and techniques in the field both in algorithmic developments as well as important applications. In a framework which consists of introductory lectures by selected international experts in the field we aim to have time for mutual exchange and discussions in a relaxed and stimulating atmosphere at the green campus of the University of Reading.

Lecturers include: Steven Schiff, Dennis McLaughlin, Tijana Janjic-Pfander, Roland Potthast, Peter-Jan van Leeuwen, Sarah Dance, Jochen Broecker, Nancy Nichols, Hendrik Reich, Africa Perianez.

Local Organizers: Africa Perianez, Etienne Roesch, Ingo Bojak, Roland Potthast, Kelly Sloan and Douglas Saddy

Time	Monday	Tuesday	Wednesday	Thursday	Friday
09:00-09:45		Special Lecture Numerical Weather Prediction I	Discussion time/Poster	Special Lecture	Special Lecture Weak constraint 4dVar
09:45-10:30		Special Lecture Numerical Weather Prediction II	Discussion time/Poster	Special Lecture	Discussion time/Poster
	Coffee	Coffee	Coffee	Coffee	Coffee
11:00-11:45	Lecture 1: DA Introduction	Lecture 3: Variational DA I 3dVar and Stability	Lecture 5: Variational DA II: Adjoints and 4dVar	Lecture 7: Ensemble Methods	Lecture 9: Particle Filters I
11:45-12:30	Lecture 2: Basics of Inverse Problems	Lecture 4: Kalman Filter	Lecture 6: Covariances, Obs. and Model Error	Lecture 8: Localization Techniques	Lecture 10: Particle Filters II
	Lunch	Lunch	Lunch	Lunch	Finish
14:00-14:45	Discussion time/Poster	Discussion time/Poster	Special Lecture Reservoir Modeling I	Discussion time/Poster	
14:45-15:30	Discussion time/Poster	Discussion time/Poster	Special Lecture Reservoir Modeling II	Discussion time/Poster	
	Coffee	Coffee	Coffee	Coffee	
16:15-17:00	Special Lecture Neuroscience I	Exercise: Coding Examples	Discussion time/Poster	Exercise: Coding Examples	
17:00-17:45	Special Lecture Neuroscience II	Exercise: Coding Examples	Discussion time/Poster	Exercise: Coding Examples	
18:00	Icebreaker			Joint Dinner	

Fee for Participants GBP 50,-. Lunches and Coffee will be provided. Please register before May 31st by email with Africa Perianez: a.perianez@pgr.reading.ac.uk. Poster contributions welcome, reserve space before May 31st!