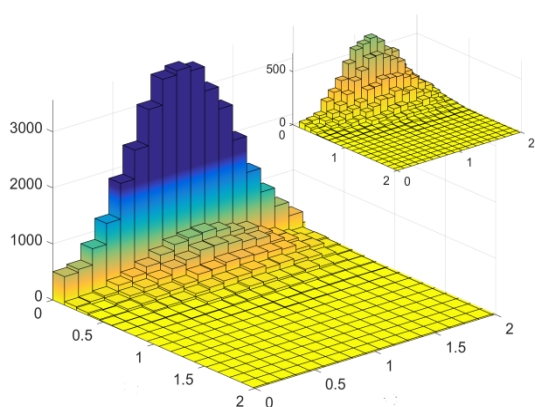


## VILLUM Investigator Grant Inauguration

## Computational Uncertainty Quantification for Inverse Problems

*Per Christian Hansen, Professor and Villum Investigator*

Uncertainty Quantification (UQ) characterizes the sensitivity of a solution taking into account the errors and inaccuracies in the measured data, the mathematical models, the algorithms, etc.



In this research initiative we develop the mathematical, statistical and computational framework for applying UQ to **inverse problems** such as

- deconvolution,
- image deblurring,
- tomographic imaging,
- source reconstruction,
- fault inspection.

The goal is to create a **modeling platform** with **software** that is suited for non-experts, and which can be used by many different industrial and academic end users.

```
variable x(n,1)
parameter delta:Gauss(mean=0.1,std=0.02) % Define unknown vector.
UQ_data_model(b,Poisson,mean=A*x_exact) % Parameter with Gauss distrib.
UQ_minimize misfit(A*x,b) % Data with Poisson noise
subject_to UQ_prior(x,sparse,delta) % Solution that fits data
% ... with a sparsity prior.
```

**Program**

- 15:00 Welcome and historical perspective  
*Rasmus Larsen, Provost, DTU*
- 15:25 VILLUM FONDEN and its role in Danish research  
*Jens Kann-Rasmussen, chairman, Villum Fonden*
- 15:15 The Villum Investigator Programme  
*Thomas Bjørnholm, Director of Science, Villum Fonden*
- 15:35 CUQI at DTU Compute  
*Per Christian Hansen, Professor & Villum Investigator*
- 15:45 Classifying Stroke Using Electrical Impedance Tomography  
*Samuli Siltanen, Professor, Univ. of Helsinki*  
*Honorary Professor at DTU Compute*
- 16:20 Closing remarks  
*Per Brockhoff, Head of Department, DTU Compute*
- 16:25 Reception

**Venue**

DTU Lyngby Campus  
Building 101, aud. S09  
2800 Kgs. Lyngby

**Date & time**

November 4, 2019  
15 – 17