

## MSc Thesis Project

### Discrete two dimensional models of data and codes

**Introduction:** Two dimensional coding is of interest in image coding, new optical/nanotech storage systems and in the description of some communication systems. This project deals with the basic problem of modeling the 2D systems and codes. Theoretically there is an issue of methods to determine the capacity and model such systems.

In image coding the issues are entropy and compression. For 2D high density storage systems, the issues are determining capacity and trade-off between constrained coding and density. The Coding & Visual Communication group at DTU Fotonik has developed new methods to model and determine capacity of 2D data.

**Contents:** In the project, the student(s) will work with methods to model 2D data both theoretically and using simulations. Besides the basic modeling problems, one of the applications may be chosen as an example in the project.

#### Prerequisites:

- Knowledge of coding techniques, e.g. from 34240 Data Compression.

#### Additional information:

- Justesen and Forchhammer, *Two-Dimensional Information Theory and Coding*, Cambridge University Press, 2010.
- Contact teacher.

**Practical details:** The project is intended for 1 or 2 students with 30 ECTS-points per student.

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