

Three-Year PhD Studentship

Variational Bayesian Filtering for Telecommunications

The Research Opportunity

A PhD studentship is available in the Department of Electronic and Electrical Engineering at Trinity College Dublin, commencing **immediately**. The project is at the heart of a collaboration with leading research institutes in Paris and Prague. The aim of the research is to develop new algorithms for Bayesian filtering using the Variational Bayes (VB) approximation¹. In the Bayesian approach, we model signals and systems using probability. Mobile communication devices present a special challenge, since we need to update these probability measures in real time, under the constraint of a limited computational resource. The trade-off between computational efficiency and accuracy is therefore of paramount importance, and the VB approach implies novel solutions. Theoretical and implementational aspects of VB filtering will be studied, while, on the practical side, we anticipate a Bayesian gain over the current state-of-the-art for synchronization in a mobile receiver.

The Ideal Candidate

The successful applicant will be from any country, and have a primary degree with a strong mathematical emphasis. Course credits in statistical signal processing, signal theory, probability and telecommunications will be desirable. The candidate will be available to begin their studies in spring/summer 2009, and will spend one month each with collaborating partners in Paris and Prague, in the first two years of their research.

The Administrative Details

The studentship will be up to the value of **€17,000** per annum, and all university fees will be paid. A travel stipend for the collaborative visits (above) and for conference presentations will also be provided. The project is supported by **Science Foundation Ireland (SFI)**.

Candidates should contact **Dr Anthony Quinn** (aquinn@tcd.ie) as soon as possible. The application is by way of a full CV, with the names of two referees.

The Future

In addition to this PhD studentship, a **post-doctoral research post of eighteen months** duration will be available from late 2009. This will focus specifically on the implementation of these VB filtering solutions in mobile receivers, and examine their relevance more widely for embedded DSP (digital signal processing) devices. Anyone interested in this opportunity is also encouraged to contact Anthony Quinn at this time.

¹For details, please see *The Variational Bayes Method in Signal Processing* by V. Šmídl and A. Quinn, Springer, Heidelberg, 2006.