



PhD position in digital communications (Thèse Cifre)

Title

Error Correction Coding for memory devices.

Keywords

Error correction coding, EEPROM memories.

Location

The Ph.D. position will be located at Telecom Bretagne (former ENST Bretagne), Brest, France. Created in 1977, TELECOM Bretagne is a member of Institut TELECOM with TELECOM ParisTech and TELECOM SudParis. TELECOM Bretagne trains future engineers for careers in industry, services and research.

The student will join the Turbo Algorithms and Circuits (TAC) group of the Electronics Department. TAC is an internationally recognized research group in the field of iterative processing for channel coding and of iterative receivers (turbo-communications) since the invention of Turbo Codes in 1993 by its leader, Prof. Claude Berrou. Claude Berrou has been awarded prestigious prizes, such as the Marconi prize in 2005.

The Ph.D. Thesis is **funded by STMicroelectronics**. The student will also be requested to spend research periods at STMicroelectronics in Marseille.

Description

EEProm memories are non volatile memories keeping data through capacitive mechanisms. Main cause of failures in such memories is the loss of single data bits due to either broken gate oxides or (more frequently) charge loss in the capacitors.

In order to improve the reliability of EEPROM memories, error correction codes are used. Currently, EEPROM memories use very simple error correcting codes based on the well-known Hamming codes, combined with hard decoding.

Future memory generations will require vast improvements in reliability due to:

- Severe automotive requirements, together with an increasing automotive market
- The evolution of manufacturing processes towards smaller memory cells, thinner tunnel oxides, which could tend to worsen the reject rate in retention of the memory cells.
- The move of the market towards higher memory densities, which increases the probability of getting a single bit fail in a memory.

This Thesis will deal with the analysis and design of novel error correcting coding techniques for future memory devices.

Requirements

Applicants must hold a Master of Science degree (or equivalent diploma) in telecommunications, electrical engineering, or computer science.

Qualified applications are invited to submit official academic records for their master education, a 1-page statement of research interest and CV, together with 2 names of professional referees (and/or reference letters), electronically to Alexandre Graell i Amat at your **earliest convenience**. The starting date is September 2008.

For further information contact:

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