Claire-Hélène DEMARTY

Senior Scientist

3, La Haye
35520 Montreuil Le Gast, France

claire-helene@demarty.org

Expertise in Computer Science, Machine Learning, Image & Video Processing, Multimedia Indexing

Professional Experience

June19-Present **Senior Scientist, InterDigital** (www.interdigital.com)

- Research on semantic video segmentation for rotoscoping. Project continuing from previous position at Technicolor. **Keywords**: semantic segmentation, object segmentation, rotoscoping, deep learning, tensorflow
- Research on perceptual understanding of media. Investigate prediction of memorability of media. Organizer of a task in the context of the MediaEval benchmarking initiative (2019 - 2020).
- Scientific supervision of Master students, postdoctoral fellows, and engineers

Oct.10-May.19 **Senior Scientist, Technicolor** (www.technicolor.com)

- Research topics:
  - Semantic video segmentation for rotoscoping. **Keywords**: semantic segmentation, object segmentation, rotoscoping, deep learning, tensorflow
  - Perceptual understanding of media. Investigate prediction of perceptual subjective concepts in media. Proposal of two tasks in the context of the MediaEval benchmarking initiative (2016-2019). **Keywords**: interestingness, memorability, perceptual understanding of multimedia content, deep learning, dataset, annotation, mechanical turk.
  - Automatic selection and ranking of images and videos for web design. **Keywords**: characteristics extraction, automatic event detection, content indexing and ranking.
  - Re-orientation of videos. **Keywords**: Video indexing, motion estimation.
  - Automatic perceptual summary. Building of POC. **Keywords**: Image and video indexing, perceptual understanding of content, event selection, temporal and multimodal processing.
  - Detection of violent scenes in movies. Proposal of a task in the context of the MediaEval benchmarking initiative (2011-2015). Supervision of a PhD. **Keywords**; SVM, Bayesian networks, audio/multimodal event detection.
- Research project leader: define strategic research axes, development of prototypes and demonstrations to shows, academic publications.
- Lead organizer of Technicolor contribution to the Quaero European program.
- Lead of the scientific seminars' project inside Technicolor. Propose and organize regular scientific animations (since 2008).
- Scientific supervision of PhD and Master students, postdoctoral fellows, and engineers

May 06-Oct.10 **Senior Research Engineer, Technicolor**

- Contribution to the definition of the scientific vision of some Technicolor R&D projects and work-packages.
- Interaction with BUs (understanding of their needs, proposal of solutions in line with these needs, transfer of technology).
- Scientific supervision of PhD and Master students, of engineers
- In charge of the coordination of Technicolor's contribution to the project CTC in the European funding program QUAERO. Work-package leader in the project Corpus (QUAERO program).

- Establishment and organization of scientific seminars in the Technicolor research centers.
- Dissemination through publications and patents. Internal and external demonstrations of technical results.
- Expertise for the evaluation of the French National Research Agency's project proposals.
- Examiner of PhD theses.
- Conception and development of software prototypes for multimodal video structuring and multimodal event detection.
- Architecture design of the CPL library framework.

Oct.04-Feb.06 **Research Engineer, Technicolor**

- In charge of mounting a funding project for the RIAM network (search of partners, elaboration of scientific and financial project proposals).
- Scientific contribution to the European project PELOPS.
- Dissemination through publications and patents.
- Reviewer of scientific papers (CVBD05).
- Conception and development of software prototypes for multimodal video structuring (application to sports videos).

Jan.04-Sep.04 **Expert Engineer,** in the Texmex team, **at Inria-Rennes** (www.inria.fr/recherche/equipes/texmex.en.html)

- In charge of the coordination of the team contribution to the funding project FERIA (Framework pour l'Expérimentation et la Réalisation Industrielle d'Applications Multimédias) - approved by the RIAM network. Leader of some of the scientific tasks.
- Supervision of Master students.
- Field of expertise: text detection, logo detection, face detection and recognition.

Sep.00-Dec.02 **R&D Engineer, LTUtechnologies** (www.ltutech.com).

- Conception and design of image processing algorithms (pattern recognition, neural networks, color segmentation)
- Realization of software prototypes (c++, perl, Tcl/Tk) and performance study.
- Product software development (re-conception, code optimization, profiling, multithreading, validation through unit/non regression testing).

Sep.95-Aug.00 **Research Engineer,** Centre de Morphologie Mathématique, **MinesParisTech.** (cmm.ensmp.fr)

- Dissemination through participation to international conferences.
- Teaching in Image Processing at MinesParisTech.
- Team leader for the management, optimization and validation of the internal software image processing library.
- Supervision of Master students.
- In charge of the scientific team contribution to several industrial contracts:
  - CTI – CCETT, **France Telecom R&D** (Jul.96 – Dec.99) : Caractérisation sémantique de documents vidéo, in collaboration with INRIA-Groupe Fractales and the Polytechnic University of Catalogna.

    Creation of a complete and operational framework for the real-time segmentation and structuring of TV newscasts. Conception of new image processing algorithms. Software development of prototypes. Performance evaluation on large databases and conformance to client requirements.
  - **Kodak-Pathé** (Jan.96 – Dec.96): Automatic orientation of still images.

    Feasibility study (definition of the client requirements, development of a software prototype, performance evaluation).
  - **Desmarquet** (Jan.96 – May 96) : Study of the 3D propagation in porous materials.

Conception and development of software code for 3D image processing with respect to the data and applicative constraints.

Education

Jan. 2000	**PhD**, Mathematical Morphology (Computer Science), MinesParisTech. Dissertation topic: Segmentation and Structuring of a Video Document for the Characterization and the Indexing of its Semantic Content. Application to TV News. Advisor: Serge Beucher, Centre de Morphologie Mathématique, MinesParisTech, Paris.
1994 - 1995	**Master of Science** in Mathematics Applied to Engineering, Université of Paris IX. Dissertation topic: Study of the application of Mathematical Morphology to image sequences.
1991 - 1994	**Master of Engineering** in Telecommunication Technologies, TelecomParisTech. Major in Image Processing.

Research Interests

Image and video segmentation, Image and video analysis and indexing, Perceptual Understanding of media, Color segmentation, Object detection, Pattern recognition, Mathematical Morphology, Meta data extraction and generation, Multimodal video structuring, Event detection, Audio classification.

Skills

Intelligent systems	Deep Learning, Bayesian networks, Hidden Markov Models, SVM
Programming	C++/C, Python, Tcl/Tk, Perl, Shell, Lisp, Ada, HTML, SQL.
Tools	Microsoft Visual, gcc & Makefile, cl, icl, git; SVN, CVS, Insure, Purify Unity, Nuke
Languages	French (native speaker), English (fluent), German (conversational)

Publications and Patents

For a complete list, see google scholar

Services

Reviewing

- ACM International Conference on Multimedia 2016, 2017, 2019
- ACM Transactions on Multimedia Computing Communications and Applications
- IEEE Transactions on Multimedia

Editorial

- Demo chair, CBMI 2017
- Special session's co-organizer, ICMR 2017
- Special session's lead organizer and chair, ICMR 2018
- Lead-organizer of the Affect Task-Violent Scene Detection in the MediaEval benchmark 2011, 2012, 2013, co-organizer in 2014 and 2015.
- Lead-organizer of the Predicting Media Interestingness Task in the MediaEval benchmark 2016, 2017.
- Lear-organizer of the Predicting Media Memorability Task in the MediaEval benchmark 2018, co-organizer in 2019, 2020.
- Editor of the Working Notes Proceedings of the Mutimedia Benchmark Workshop, MediaEval 2011, MediaEval 2016, MediaEval 2017, MediaEval 2018

Supervision

- Maxime Bichon, Bachelor Student, 2014

- Arthur Crenn, Bachelor Student, 2014
- Maxime Rivière, Bachelor Student, 2014
- Mathis Piquet, Bachelor Student, 2018
- Danchi Li, Bachelor Student, 2018

- Ayoub Massoudi, Master Student, 2005
- Erwan Jouneau, Master Student, 2006
- Abderrazek Boufahja, Master Student, 2009
- Sébastien Marret, Master Student, 2009
- Cédric Pénet, Master Student, 2010
- Pau Beltran, Master Student, 2012
- Pierre Wargnier, Master Student, 2013
- Shriman Tiwari, Master Student, 2015
- Yuesong Shen, Master Student, 2016
- Eloise Berson, Master Student, 2017
- Hammad Squalli, Master Student, 2017
- Karthik Yadati, PhD Student 2017
- Samuel Pierre, Master Student, 2018
- Théo Dumont, Master Student, 2020

- Siwar Baghdadi, PhD Student, « Sparse events detection in videos with Bayesian networks », 2005-2008
- Cédric Pénet, PhD Student, « Multimodal content-based analysis for video on demand », 2011-2013
- Karthik Yadati, PhD Student 2017 (summer internship)

- Romain Cohendet, postdoctoral fellow, « Prediction of video memorability », 2018 - 2019
- Pablo Garrido, postdoctoral fellow, « Interactive video segmentation », 2018 - 2019

- Examiner PhD Thesis Abdelaali Hassaine, « Restoration of ancient movies and soundtracks », 2009
- Examiner PhD Thesis Nadia Derbas, « Contribution to the detection of concepts and events in videos », 2014