James MURE-DUBOIS
rue des Parcs, 67
CH-2000 Neuchâtel

Tel : +41 77 485 54 70
jmuredubois@outlook.com

Born on May 10th 1982
Swiss and French citizen

Research scientist, Digital Signal Processing
PhD in Science, micro- and nanotechnology

Professionnal record

Jan 2013– Jun 2014 (18 months)	**Intermec Scanner Technology Center - Toulouse** *Software engineer* Image processing aiming at improving 1D and 2D decoding libraries ▷ *Exploring algorithms for high dynamic range images.* ▷ *Setup of a blackbox testing solution.*	
Feb 2012– Nov 2012 (10 months)	**NTU (Nanyang Technological University) - Singapore** *Research scientist in the Radar Centre of Temasek Laboratories* Algorithms for high-resolution SAR imaging from highly unstable platforms ▷ *Motion compensation and autofocus algorithms in the unstable SAR imaging context.*	
Dec 2009– Nov 2011 (2 years)	**TéSA (Telecommunications for Space and Aeronautics) - Toulouse** *Research scientist in the Signal Processing unit* Signal processing algorithms for radar data measured with embedded automotive sensors. ▷ *High resolution applications of synthetic aperture radar and digital beamforming algorithms.* ▷ *Required compliance with stringent automotive industry requirements.*	
2005–2009 (4 years)	**Institute of microtechnology (Univ. of Neuchâtel - EPFL)** *Research-assistant in the pattern recognition laboratory (PARLAB).* Contributing to various research projects in the lab, involvment in teaching for the pattern recognition and microprocessors lectures. ▷ *Research projects in collaboration with industry (CTI).* ▷ *Mentoring students for semester and diploma projects.*	
2005 (6 months)	**Logitech Inc. - Fremont, California** *Intern in the system engineering department of the webcam division.* Working on a project aiming to improve audio quality in webcam conversations. ▷ *Audio signal processing.* ▷ *Study taking into account constraints for mass produced devices.*	
2004 (3 months)	**Paul Scherrer Institute - Villigen, Suisse** *Intern at the laboratory of micro et nano-technology (LMN).* Optimization of a setup producing large structures with sub-micron resolutions. ▷ *Work in clean room environment.* ▷ *Laser interference lithography.*	

Education

2005–2009	**PhD in Microtechnology** *Contributions to image processing algorithms for advanced 3D vision devices.* IMT-PARLAB (Univ. of Neuchâtel - EPFL).
2000–2005	**Master of Science in Micro- and Nanotechnology** *cum laude* University of Neuchâtel.
1997–2000	**Scientific high school diploma** *magna cum laude.* Lycée Denis-de-Rougemont, Neuchâtel.

IT skills

Oper. systems :	MS Windows (7, 8, XP), Linux (Ubuntu, Debian), Mac OS X
Programming :	Matlab, C, C++, Python, C#, Java, LabView
Development :	MS Visual Studio, Eclipse, git, hg, SVN, CVS, ClearCase

Languages

French :	Mother tongue.
English :	fluent.
German :	read, basic redaction, general conversation.

Research interests

Low power signal processing : Selection of appropriate architecture, complying with application requirements in the most efficient manner, for embedded systems with low power constraints or image processing systems with real-time requirements.

Image processing : 3D images acquisition, fast filtering for reduction of measurement errors, registration of multiple 3D views.

Programming and visualization : Prototyping in Matlab. Development of multi-platforms applications with intuitive graphical users interfaces, using *open-source* libraries.

Radar signal processing : Definition of radar architecture, waveform selection, low level processing for extraction of basic information (distance, velocity), array processing methods (Digital Beam Forming, Synthetic Aperture Radar) for positioning applications.

Previous research works

2012 (10 months)	**Unstable SAR project** Low weight radar carriers tend to have unstable trajectories leading to non-optimal SAR image focusing, even after motion compensation. This research project investigated efficient SAR focusing strategies allowing to mitigate the effects of undesired motion. *Post-doc, collaboration with Temasek Laboratories at NTU and DSO.*
2009-2011 (24 months)	**id4car ARPOD project** Automotive radar systems embedded in vehicles enhance the level of protection for all road users. DBF and SAR algorithms were developed for 77GHz FMCW radar prototypes, and feasibility was demonstrated for two new applications in parking assistance and pedestrian detection. *Post-doc, collaboration with François Vincent, ISAE Toulouse.*
2010 (8 months)	**FP7 MOSARIM project** State-of-the-art review of interference mitigation techniques in the context of embedded automotive radars and preliminary evaluation of selected CDMA methods through Matlab simulations.
2005–2009 (4 years)	**Contributions to image processing algorithms for advanced 3D vision devices** This research work focused on 3D vision for microassembly and on real-time 3D vision with time-of-flight (TOF) methods. Various algorithms for reduction of measurement errors have been developped. Eventually, a network of TOF cameras was implemented, for application in surveillance systems. *PhD thesis - Thesis director : Heinz Hügli (IMT-PARLAB, Univ. of Neuchâtel).*
2006-2007 (12 months)	**CTI PersPass project** Access-control systems based on video cameras create strong usage constraints, especially concerning lighting and requirement for spatially textured backgrounds in the control zones. The aim of project PersPass was to develop more flexible access-control systems, involving 3D cameras. A demonstration setup was realized during the project. Various access-control systems based on 3D vision have been commercialized by the project's industrial partner.
2005-2006 (12 months)	**CTI MiniVision project** Visual servoing is required for high-precision micro-assembly operations. The Minivision project aimed to develop a miniature 3D vision system with high resolution, and potential for embedment. The target application was visual servoing for a micro-assembly robot based on parallel architecture, allowing for high assembly throughput. A prototype of miniature depth-from-focus microscope was realized, and its depth resolution was characterized.
2005 (6 months)	**Software beam forming for low cost microphone array** The goal of this research project was to study noise reduction methods involving microphone arrays, within boundaries imposed by Logitech Inc. for the intended application of such methods, i.e. integration of a software beam-former in devices for hands-free, computer based audio-video conversation. *Master's thesis - Mentors : Jean-Michel Chardon (Logitech Inc., Fremont, CA) and Giuseppina Biundo (IMT-ESPLAB, Univ. of Neuchâtel). Grade : 5/6*

Previous research works (continued)

2004 (3 months)	**Realization of periodic line patterns by laser interference lithography** This short project concerned optimization of a laser setup for producing gratings with sub-micron resolution on large areas. The work was performed on a laser interference lithography setup in the LMN clean room facilities. *Internship - Mentor : Harun Solak (LMN, Paul Scherrer Institute, Villigen)*
2004 (2 months)	**Speaker recognition for mobile device** In mobile applications, speaker recognition algorithms must have low-complexity. Different combinations of features and statistical classifiers (GMM and HMM) were considered, looking for the best trade-off between complexity and recognition performance. *Semester work - Mentor : Pascal Geiser (IMT-ESPLAB, Univ. of Neuchâtel). Grade : 5.5/6*
2003 (2 months)	**Study of different electronic circuits for capacitive feedback position control of a MEMS actuator.** The goal of this project was to study different methods used in tracking small capacitance variations, in order to accurately control the position of a MEMS actuator developed at SAMLAB. *Semester work - Mentor : Thomas Overstolz (IMT-SAMLAB, Univ. of Neuchâtel). Grade : 5.5/6*

Publications

September 2011	James Mure-Dubois, François Vincent & David Bonacci. **Sonar and Radar SAR Processing for Parking Lot Detection**. *In : International Radar Symposium*, Leipzig 2011.
August 2009	James Mure-Dubois. **Contributions to image processing algorithms for advanced 3D vision devices**. *PhD thesis* Univ. of Neuchâtel, 2009.
October 2008	James Mure-Dubois & Heinz Hügli. **Fusion of Time-of-Flight Camera Point Clouds**. *In : Workshop on Multi-camera and Multi-modal Sensor Fusion Algorithms and Applications*, Marseille 2008.
August 2008	James Mure-Dubois & Heinz Hügli. **Merging of range images for inspection or safety applications**. *Pages 70660K 1–12 of : Two- and Three-Dimensional Methods for Inspection and Metrology VI*, San Diego. Proc. SPIE, vol. 7066.
April 2008	James Mure-Dubois & Heinz Hügli. **Automated inspection of microlens arrays**. *Pages 700007 1–9 of : Optical and Digital Image Processing*, Strasbourg. Proc. SPIE, vol. 7000.
September 2007	James Mure-Dubois & Heinz Hügli. **Optimized scattering compensation for time-of-flight camera**. *Pages 67620H 1–11 of : Two- and Three-Dimensional Methods for Inspection and Metrology V*, San Diego. Proc. SPIE, vol. 6762.
July 2007	James Mure-Dubois & Heinz Hügli. **Time-of-flight imaging of indoor scenes with scattering compensation**. *Pages 117–123 of : Proc. O3D 2008*, Zürich.
March 2007	James Mure-Dubois & Heinz Hügli. **Real-time scattering compensation for time-of-flight camera**. *In : Proc. of the ICVS 2007*, Bielefeld. International Conference on Computer Vision Systems 2007.

Publications (continued)

October 2006	James Mure-Dubois & Heinz Hügli. **Embedded 3D vision system for automated micro-assembly**. *Pages 63820J 1–10 of : Two- and Three-Dimensional Methods for Inspection and Metrology IV*, Boston. Proc. SPIE, vol. 6382.
October 2006	Heinz Hügli & James Mure-Dubois. **3D vision methods and selected experiences in micro and macro applications**. *Pages 638209 1–11 of : Two- and Three-Dimensional Methods for Inspection and Metrology IV*, Boston. Proc. SPIE, vol. 6382.

Teaching

Jan 2010– Nov 2011	**ISAE (Inst. Supérieur de l'Aéronautique et de l'Espace, Toulouse)** *Teaching assistant in Digital Signal Processing* Helping students with their lecture assignments, and grading their work (8hr/semester)
2009 2008 2006	**Institute of microtechnology (Univ. of Neuchâtel - EPFL)** *Teaching assistant in Pattern Recognition* Helping students with their lecture assignments, and grading their work (14hr/semester)
2007	**Institute of microtechnology (Univ. of Neuchâtel)** *Teaching assistant in Microprocessors* Helping students with their lecture assignments and laboratory assignments (ARM7 assembler and C), grading students work (14hr/semester)
2007	**Institute of microtechnology (Univ. of Neuchâtel)** *Teaching assistant in Image Processing* Helping students with their lecture assignments, and grading their work (14hr/semester)

Hobbies and interests

Mountains :	Hiking (on foot, or with snowshoes), jogging, skiing.
Reading :	Nonspecialist science books (Hawking, Greene), Science-fiction (Herbert, Asimov), spy novels (Clancy), biographies (Feynmann, Einstein)
Free software :	Using and developing *open-source* applications
Miscellaneous :	Cinema, cooking, etc.