

Dr. Aboubacar Chaehoi, CEng

MEMS / Micro and Nano-technology

SEMICONDUCTOR INDUSTRY EXPERIENCE

2019 – Now **Technical Leader**, TDK-Micronas, Freiburg, Germany (www.micronas.tdk.com)

TDK-Micronas is a globally operating manufacturer of semiconductors which develops and produces IC and sensor system solutions for automotive and industrial electronics. My responsibilities include:

- Technical Responsible for the development of magnetic field sensor products for automotive application
- Plan and report of product verification, evaluation, characterization, qualification
- Undertake execution of technical tasks as necessary with the rest of the team dedicated to the product development
- Main interface between customers and R&D group for technical related requests

Key Achievements

- Management of the development of magnetic field sensors for automotive application.

2015 – 2018 **Senior Sensor Engineer – Project Leader**, ZF-TRW, Radolfzell, Germany (www.zf.com)

ZF-TRW - one of the largest automotive suppliers worldwide - is a global leader in electronics and sensors for automotive active and passive safety technology. My responsibilities include:

- Author MEMS sensor and component specification and documentation (accelerometers, gyroscopes, pressure sensors)
- Establish development timing, performing and reporting
- Coordinate prototype testing and characterization, Support component PPAP and production launch tasks
- Key responsibility to interface with MEMS suppliers and to support ZF-TRW customers and Quality for sensor components

Key Achievements

- Management and Development of MEMS for automotive application from sensor definition to PPAP and production.

2013 – 2014 **Technical Project Manager**, CEA-Leti, Grenoble, France (www-leti.cea.fr/en)

Leti is a department of CEA, a research and technology organization with activities in energy, IT, healthcare, defense, and security. It specializes in nanotechnologies and their applications. My responsibilities include:

- Project management for the development of a high-performance accelerometer on a breakthrough technology combining micro- and nano-electromechanical systems (M&NEMS®).
- Coordination of technical teams (layout and masks development, process and fabrication)
- Tasks planning and control, risks assessment and management, customer relationship management
- Design of M&NEMS® accelerometers and pressure sensors.

Key Achievements

- Technical project management and sensors design.
- **Patent US20170261528**: "Damped Linear Accelerometer", B.Fain, A.Chaehoi, P.Robert, Sept 14th 2017
- **Patent EP3217181 A1**: "Accelerometre lineaire amorti" , B.Fain, A.Chaehoi, P.Robert, Sept 13th 2017

2012 **Inertial Sensor Expert**, IXBLUE, Lannion, France (www.ixblue.com)

IXBLUE is a Global Solution Provider delivering Inertial, Motion, Subsea Acoustic, Seabed Mapping and Sub Bottom Profiling Products and Systems. My responsibilities include:

- Support the development and the industrialization of a high-performance quartz-based accelerometer
- Thermo-mechanical modelling of packaging and electronics effect
- Develop FEM models of the entire sensor to improve the mechanical and thermal behaviour performances.

Key Achievements

- Support the development phase towards completion. Product industrialization ready to kick-off.

2006 – 2012 Institute for System Level Integration (ISLI), Edimburg, UK (www.isli.co.uk).

ISLI is an R&D and technology transfer service company that supports the development of electronics systems and MEMS and explores new technologies through research.

2009 – 2012 **Senior MEMS Designer**

My responsibilities include:

- Design of a monolithically (MEMS and ASIC) integrated 3-axis piezoresistive accelerometer and a pressure sensor on an SOI-process developed with a major UK-based MEMS player (Semefab).
- Authored European and national research project proposals (formation of consortia, identification of potential funding routes, drawing up of the proposal document and project planning).
- Provide expertise and consultancy in micro-sensors for Scottish SMEs.
- Guest lecturer, Heriot-Watt University, Year 4 and 5 of Mechanical Engineering degree programs.

2006 – 2009 MEMS Designer

My responsibilities include:

- Support the development and integration of a CMOS-SOI MEMS-compatible process for Semfab
- Dissemination of R&D results at international conferences and journals. My research field includes monolithic CMOS-MEMS sensors, piezoelectric micro-actuators and MEMS DC/DC converters.
- Project supervision of several MSc students: *“Development and Design of an integrated Gimbal Gyroscope”*, *“Design of low-power hotplate for MEMS capacitive humidity sensors”*, and collaborative PhD research project *“Sigma-Delta modulator conditioning system for Pellistor-type Gas Sensors”*.

Key Achievements at ISLI (2006 – 2012)

- Project lead in commercial and research projects, including authoring and investigation of research funding proposal
- Design and prototyping of MEMS sensors with fully integrated CMOS electronics on SOI with a complete wafer-level packaging solution (BCB and anodic bonding)
- Device testing, characterisation, and failure analysis

RESEARCH EXPERIENCE

2002 – 2005 Researcher (Doctorate), Laboratoire d’Informatique et de Microélectronique de Montpellier
Design and characterization of a 3-axis accelerometer in CMOS-FSBM technology (AMS CMOS technology).

<http://tel.archives-ouvertes.fr/tel-00277563/fr/>

Key Achievements

- Design of a CMOS-FSBM 3-axis accelerometer using both piezoresistive and thermal transduction.
- Developed skills in CAD and FEM tools (CADENCE, ANSYS).
- Publications and oral presentations in major international IEEE sponsored conferences
- Teaching experience: Labs on Pspice simulation; Labs on C language.
- Monitoring experience: project advisor of a Master in Engineering student, thesis: *“Active damping of resonant accelerometers using electromagnetic forces”* and a postgraduate student, thesis: *“Test of monolithic MEMS”*.

2002 Intern Researcher, Laboratoire d’Informatique et de Microélectronique de Montpellier, France
Development and evaluation of an oscillation based-test method for monolithic MEMS.

Key Achievements

- Evaluation of a test method - originally designed for analog electronics - for MEMS testing, using CADENCE simulation tools (Analog Artist, Monte Carlo simulations, AHDL language)
- Development of a new test method for MEMS, leading to publications in international conferences

2001 Research Assistant, Centre d’Electronique et de Micro-Optoélectronique de Montpellier, France
Design of Pelletier-based micro-sensors (Thermopile with constant temperature of sensing surface and vacuum sensor)

Key Achievements

- Research and Development of electronic circuit and performance evaluation of a thermopile and a vacuum sensor.
- Fabrication of micro-sensors. Design and simulation of the read-out electronic circuitry (P-SPICE).

EDUCATION

2002 – 2005 PhD Microelectronics/MEMS, Université de Montpellier - France & Universtà Degli Studi di Catania - Italy

2001 – 2002 Postgraduate degree (Hons) Microelectronics, University of Montpellier, France

2000 – 2001 MSc Electronics Engineering, University of Montpellier, France

TECHNICAL SKILLS

- FEM: Ansys, CoventorWare, MEMS+, Comsol Multiphysics
- CAD: Synopsis, Cadence, CleWin, P-Spice
- Analytical Simulations: Maple, Matlab, Python

ACTIVITIES & INTERESTS

- **Sport:** mountain biking and kickboxing/K1/Muaythai boxing

LANGUAGES

- English: Fluent (I am the French-to-English translator of: M. Wautelet, [Nanotechnologies](#), IET 2009, 0863419416)
- French: Native
- German: Conversational