I earned my PhD in Microsystem and Microelectronics at the École Polytechnique Fédérale de Lausanne (EPFL), in Switzerland. My doctoral thesis was titled, “Carbon Nanotube Electromechanical Devices for Radio Frequency Application”. I am currently working for the DARPA funded project, Electrochemical Quantum Biomolecular Transducer (DARPA BAA-11-07). The Swiss National Foundation promoting perspective researchers are currently funding my stay at Stanford. My research interest includes bio-sensor and applying MEMS technology for energy harvesting and medical application.

Under the DARPA project, Quantum Biomolecular Transducer, I am working on optimizing an electro-chemical interface using silicon micromachining technology. Electrochemical interface engineering is very crucial in the study of electron transfer. For practical application it is important that the technology platform is scalable and has potential for mass fabrication. Figure 1 below shows the implementation set-up to perform electrochemical measurements on microelectrodes fabricated on silicon substrate.

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| Figure 1a: Microfabricated electrodes fabricated on silicon substrate mounted on to a holder fabricated in PEEK; also seen to the right is the holder lid with O-ring | Figure 1b: The setup while measurement is being performed. |

I am also working on the design of metal-insulator-metal (MIM) structures for application in gas/molecule sensing. To fabricate a MIM structure the interface is very crucial. Since the device works on the principle of tunneling current, it is necessary that the surface of the metal is smooth and there are no defects in the insulator. I am investigating the surface roughness of metals deposited by atomic layer deposition to see its potential of application in MIM structure

Publications

http://scholar.google.com/citations?hl=en&user=b6yNG0MAAAAJ

• A. Arun, S. Campidelli, A. Filoramo, V. Derycke, P. Salet, A. M. Ionescu and M. F. Goffman “SWNT array resonant gate MOS transistor”, Nanotechnology, 22, 055204 (2011).

• A. Arun, H. Le Poche, T. Idda, D. Acquaviva, M. Fernandez-Bolanos Badia, P. Pantigny, P. Salet and A. M. Ionescu, “Tuneable MEMS Capacitor using Vertical Carbon Nanotube Arrays Grown on Metal Lines”, Nanotechnology, 22, 025203 (2011).

• A. Arun, P. Salet, A. M. Ionescu, "A Study of Deterministic Positioning of Carbon Nanotubes by Dielectrophoresis", Journal of Electronic Materials, 38 (6), 742-749, (2009).

• D. Acquaviva, A. Arun, S. Esconjauregui, R. Smajda, A. Magrez, D. Bouvet, L. Forro, J. Robertson, and A. M. Ionescu, “Capacitive Nano-Electro-Mechanical Switch based on Suspended Carbon Nanotube Array”, Applied Physics Letters, 97, 233508 (2010).

• A. Arun, D. Acquaviva, M. Fernández-Bolaños, P. Salet, H. Le-Poche, P. Pantigny, T. Idda and A. Ionescu, “Carbon nanotube vertical membranes for electrostatically actuated micro-electro- mechanical devices”, Microelectron. Eng. 87, 1281-1283 (2009).

• A. Arun, M. Goffman, D. Grogg, T. Idda, P. Salet and A. M. Ionescu, “Tunable Electromechanical Resonator based on Carbon Nanotube Array Suspended Gate Field Effect Transistor”, Proceedings of 23rd IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2010, oral presentation), Hong Kong, 2010, pp. 112-115.

• A. Arun, D. Acquaviva, M. Fernández-Bolaños, P. Salet, H. Le-Poche, T. Idda, R. Smajda, A. Magrez, L. Forro, A. M. Ionescu, "Micro-Electro-Mechanical Capacitors Based on Vertical Carbon Nanotube Arrays", Proceedings of 39th IEEE European Solid State Device Research Conference (ESSDERC), Athens, 2009, pp. 335 – 338.

• A. Arun, P. Salet, A. M. Ionescu, "Trapping Individual Carbon Nanotubes", Electronic Materials Conference, Santa Barbara, USA, 2008.