Carlo Filippeschi
Curriculum Vitae

INFORMAZIONI GENERALI

Data	01/10/2018
Dati Personali	
Nome	Carlo Filippeschi
Data di nascita	

POSIZIONE LAVORATIVA ATTUALE E PRECEDENTI

2014 – Ad Oggi

- **Tenico Senior:** presso il centro Micro-BioRobotics@SSSA (CMBR), Istituto Italiano di Tecnologia in Pontedera (Pi), Italy.

2010 - 2014

- **Tecnico Senior:** Distaccato dalla Scuola sant'Anna presso il centro Micro-BioRobotics@SSSA (CMBR), Istituto Italiano di Tecnologia in Pontedera (Pi), Italy
- **Tecnico di Laboratorio (tempo indeterminato livello D)** Presso l'Istituto di Biorobotica della Scuola Superiore S.Anna, Pontedera (Pi), Italy.

2002 - 2010

- **Tecnico di laboratorio (Tempo Indeterminato livello D),** Center for Research in Microengineering (CRIM) in Pontedera (Pi), Italy.

1998-2002

- **Assistente Tecnico (Tempo Indeterminato livello C)**, MiTech-Lab (Microfabrication Technology lab), Scuola Superiore S.Anna, Pisa, Italy.

1991-1998

- **Contratti libero professionali**, MiTech-Lab (Microfabrication Technology lab) and ARTS- Lab (Advanced Robotic Technology and System), Scuola Superiore Sant'Anna, Pisa, Italy.

1990-1991

- **Contratti libero professionali,** Bioengineering Research Center - E. Piaggio, University of Pisa, Italy.

EDUCAZIONE E FORMAZIONE

1984

- **Diploma di Scuola Secondaria superiore,** Fisica Industriale, Istituto Tecnico Statale "Leonardo Da Vinci", Pisa (Italia).

Corsi di specializzazione e training:

- **Etching Technology: lithography and Silicon chemical etch;** Fondation Suisse Pour pour la recherque in microtechnique (FSRM)/ MESA Institute Twente (Pisa, Italy, 1996).
- **Scanning probe microscopy: AFM – STM – SNOM;** Biology department of Roma University Tor Vergata /Assing S.p.A (Rome, Italy, 1996).
- **Wire EDM Technology basic course;** Charmilles Technologies (Milano, Italy, 1997)
- **Intoduction to Microsystem and Nanotechnology;** Italian Association for Sensors and Microsystems – AISEM (Pisa, Italy, 2001).

- **Flexible Circuit preparation, shape deposition manufacturing and SU-8 Lithography;** Prof. Mark Cutkosky Stanford University (Pontedera, Italia, 2002).
- **Focused Ion Beam: nanostructuring and 3D Analysis of Materials;** Theory and Practice School SISM – Italian Society of Microscopy (Modena, Italia, 2004).
- **1st NIC@IIT Microscopy 2.0 – Practical Workshop on Advanced Microscopy** (Genova, Italia, 2014)
- **International School on Nanoscale Optical Microscopy** (Venezia, Italia, 2017).
- **Chemical Risk safety course;** Scuola Superiore S.anna and Bio Salus Company (Pontedera, Italia, 2005).
- **Safety Supervisor in research laboratories**; Scuola Superiore S.Anna (Pontedera, Italia, 2010).
- **Safety Supervisor in research laboratories;** Istituto Italiano di Tecnologia – Confindustria Genova (Genova, Italy, 2012).
- **Waste Management System SISTRI**; SIGE S.r.l. Industrial Service Genova (Genova, Italia, 2011).

INSEGNAMENTO E TUTORAGGIO

2013-ad oggi

Dottorato in Micro-BioRoboticotica, Scuola Superiore Sant'Anna/Istituto Italiano di Tecnologia, tema del corso **"Fundamentals Technologies for Biorobotics"**:

- Introduction to Clean Room Best Practice;
- Basic Introduction to Focused Ion Beam and Dual Beam Microscopy workstation and their main applications;
- Basic Introduction to Micro Photolithography, 3D direct laser nanolithography, PVD Thin film deposition and their main applications;

Tutoraggio e supervision di studenti:

Studenti PhD

- Silvia Bossi, "Development of a new generation of neural invasive interface" Dottorato in Biorobotics Science and Engineering, Institute for Advanced Studies Lucca / Scuola Superiore S.Anna Marzo 2005 – July 2008. Posizione attuale: Ricercatrice all'ENEA (Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile), Fondatrice di SMANIA srl (Novembre 2012).

RESPONSABILITA'ED INCARICHI

- **Responsabile** della supervisione, operatività e manutenzione per le facilities di micro e nanofabbricazione e caratterizzazione del Centro Micro-BioRobotics@SSSA (CMBR) dell'Istituto Italiano di Tecnologia (IIT) (2010 – ad oggi).
- **ASPP** (addetto al servizio di prpotezione prevenzione) del Centro Micro-BioRobotics@SSSA (CMBR) dell'Istituto Italiano di Tecnologia (IIT) (2017 – ad oggi)
- **Responsabile** delle procedure di sicurezza della camera Bianca presso il Center for Micro-BioRobotics@SSSA (CMBR) of the Istituto Italiano di Tecnologia (IIT) (2010 – ad oggi).
- **Responsabile** della supervisione delle apparecchiature per micro e nano tecnologie e della camara bianca dell'Istituto di Biorobotica (ex CRIM/ARTS Lab) della Scuola Superiore S.Anna (2002 – ad oggi).

COMPETENZE TECNICHE E PROFESSIONALI

- Dual Beam FIB/SEM nanofabrication and characterization microscopy workstation (milling, imaging, gas assisted chemistry deposition and etching, nanomanipulation, EDX microalnalysis, STEM). Esperienza con: FEI HELIOS 600 Dual Beam, Bruker EDX, Omniprobe and Kliendiek Nanoanipulator.
- Focused Ion Beam (FIB) ultraprecision microscopy workstation with GIS Chemistry etching and Deposition. Esperienza con: FEI FIB 200 (Pt deposition, Enhanced Etch and SiO_2 deposition).
- Low Vacuum Scanning Electron Microscope LVSEM and EDX Microanalisys. Esperienza con: Zeiss EVO MA 10 and Oxford EDX.
- 3D Direct laser writing micro and nanofabrication lithograpy micro and nano fabrication. Esperienza con: Nanoscribe Photonic Professional.
- Scanning Probe Microscopy (AFM, STM, MFM). Esperienza con: Bruker Innova and Topometrix TMX 2000.
- PVD Processes: RF/DC Magnetron Sputtering and Thermal Evaporator Thin Film Deposition. Esperienza con: Leybold, Sistec, Tecnoservice System.
- Steam Oxidation Furnace for epitaxial thin film growth. Esperienza con: Heraeus Rof 100 Tubolar System.
- Micro photolithography bench hood processes and wet etch and dry etch of metals and polymers. Esperienza con: Arias Lithographic wet chemical Bench workstation, Karl Suss MA-6 and MJB 3 mask Aligner.
- Stylus roughness and profile measurement an optical profiler characterization. Esperienza con: Zeiss TSK Surfcom 130, KLA Tencor P6, Leica DCM 3D Profilometer.
- 3D high resolution fiber optics microscope, optical microscope and Confocal Microscope. Esperienza con: HIROX KH 2700 Videomicroscope, NIKON C2 Confocal Microscope, Nikon Eclipse Inverted Microscope.
- Probe tester station with four manipulators. Esperienza con: Cascade P5 Probe Tester.
- Micro sink and Wire Electro Discharge Machining. Experience with: SARIX SH 200 Micro EDM.
- Precision Mechanics machine tool workshop equipment (Milling Machine, Lathe Machine, Drilling, stress and strain measurement). Esperienza con: Eumega and Bridgeport millling machine, Angelini AM 125 lathe machine.
- CO_2 laser cutter printer and non contact fluid deposition system ink jet printer. Esperienza con: Versa Laser vls 3.50 and Fuji Dimatix Ink Jet printer.
- Manual wedge wire bonder. Esperienza con: Kulike & Soffa 4523.

Lingue conosciute:

- Italiano, Inglese (buono).

PARTECIPAZIONE A PROGETTI EUROPEI

Commissione Europea e Internazionali (Scuola Superiore Sant'Anna)

- **MERIDIAN (FP7-NMP-2011-SMALL-5)** - Micro and Nano Engineered Bi-Directional Carbon Interface. Activity: thin film deposition and characterization for neural interface microdevices.
- **INTEGR MICRO (FP7 – 2008 – 2012)** - New production technologies of complex 3D micro – devices through multi-process integration of ultra precision engineering techniques. Activity: Micro EDM component fabrication and characterization.
- **ARAKNES (FP7 -2007-2013)** - Array of robots augmenting the kinematics of endoluminal surgery. Activity. Precision mechanical component assembly and fabrication.

- **TIME (FP7-ICT-2007.2-3.6 Micro/Nanosystems)-** Transverse, Intrafascicular Multichannel Electrode system for induction of sensation and treatment of phantom limb in amputees. Activity: clean room microlithography processes for electrodes microfabrication and characterization.
- **NANOBIOTACT (EU IST 2006 – 2010) -** Nanoengineering biomimetic tactile sensors . Activity: tactile sensor micro array characterization.
- **VECTOR (EU IST INTEGRATED PROJECT 2006-2010)-** Versatile Endoscopic Capsule for Gastrointestinal Tumor Recognition and Therapy. Activity: Precision Mechanics and Micro EDM fabrication. Activity: Manufacturing of micro component by micro sink EDM
- **NINIVE (EU IST STREP 2006-2009) -** Non Invasive Nanotransducer for in vivo gene teraphy. Activity: nano materials and surface structuting and characterization by focused ion beam.
- **DACTIN (Collaboration between Scuola Superiore Sant'Anna and Korea Institute of Science and Technology 2006-2008) -** Design of ACTuated INtraneural electrodes. Activity: NiTi film deposition and focused ion beam characterization for sma actuated micro electrodes.
- **I-SWARM (Progr. IST FET 2004) -** Intelligent small World Autonomus Robot for Micro Manipulation. Activity: Assembly of micromechanical components and characterization of miniature flexure joints.
- **ASSEMIC (Prog. Marie Curie-2004)** Advanced Methods and Tools for Handling and in Microtechnology. Activity: microassembly tools and strategies (self-assembly, bonding, soldering).
- **BIOLOCH (Progr IST-FET 2004) -** Biomimetic Structures for Locomotion in the Human Body. Activity: manufacturing of micro devices and components.
- **EMILOC (IMC Seoul Korea-SSSA 2003) -** Endoscopic Microcapsule Locomotion and Control. Activity: manufacturing of micro devices and components.
- **CYBERHAND (IST-2001-35094 - EU project) -** Development of cybernetic hand prosthesis. Activity: micro force sensor assembly and characterization.
- **EMECAP (Prog. IST FET 2001 - 2004) -** European Mercury Emission from Chlor Alkali Plants. Activity: thin film deposition for mercury detection sensors.
- **EMIL (IMC Seoul Korea-SSSA 2000 - 2003) -** Endoscopic Microcapsule Locomotion. Activity: manufacturing of micro devices and components.
- **MICRON (PROG. IST FET 2000 - 2003) -** Miniaturized Cooperative Robots advance towards the NanoRange. Activity: assembly and characterization of micro and nano manipulation tools.
- **MEDEA (Prog. BIOMED 2 1998-2001) -** Micro Scanning Endoscope with Diagnostics and Enhanced Resolution Attributes. Activity: manufacturing of micro devices and components.
- **Competence Centre no.5 Microfluidics (Prog. Europractice 1997-2000)** Activity: manufacturing of micro device and component.
- **MUSIC (Prog. Biomed 2 1997-2000) -** Multifuncional Minirobot System for Endoscopy. Activity: manufacturing and assembly of micro devices and components.
- **MINIMAN (Prog. ESPRIT 1997-2000)** - Miniaturized Robot for Micromanipulation. Activity: fabrication, assembly and characterization of micro and nano manipulation tools.
- **MICRO-CARD (Prog. ESPRIT 1997-2000) -** Si Based Multifdunctional Microsystem Needle for Myocardial Ischemia Monitoring. Activity: fabrication, assembly and characterization of micro and nano manipulation tools.
- **SAMA (Prog. Brite Euram 1993-1996) -** Shape Memory Alloy Micro Actuator For Medical Application. Activity: SMA based micro actuator fabrication and characterization.
- **MITOS (Prog. Brite Euram 1993-1996) -** Innovative Mechatronics Tools And Systems for Surgical Procedures. Activity: fabrication of surgical tools components.
- **INTER (Prog. Brite Euram 1993-1996) -** Intelligent Neural Interface. Activity: neural interface microdevice fabrication, assembly and Characterization.

Progetti Industriali Nazionali (Scuola Superiore S.Anna)

- **Pavoni Diffusion s.r.l.(1993)** - Development of termomethric device for Hyperthermia. Activity: fabrication, assembly and packaging of thermometric device.
- **FIRB MULTITASKING (MIUR 2007-2010)** - Advanced Manufacturing System for miniaturized device. Activity: Micro EDM component fabrication and characterization.
- **FISR Project (MIUR 2000)** - Realization of microsystem for chemical and physical properties of mini and micro bio-tissue Samples. Activity: manufacturing and assembly of micro device and component.

ATTIVITÀ DI SFRUTTAMENTO DEI RISULTATI DELLA RICERCA

Aziende Spin-off
2012-present

- **Co - Fondatore ,** SMANIA - Smart Neural Interface - srl (www.smania.info), una start up biomedica biomedical star della Scuola Superiore S.Anna, per il disegno e lo sviluppo di interface neurali di tipo invasivo.

PUBBLICAZIONI SCIENTIFICHE

"Approximating gecko setae via direct laser lithography" Tricinci, O., Eason, E.V., Filippeschi, C., (...), Greco, F., Mattoli, V. 2018 Smart Materials and Structures 27(7),075009

"A 3D Real-Scale, Biomimetic, and Biohybrid Model of the Blood-Brain Barrier Fabricated through Two-Photon Lithography" Marino, A., Tricinci, O., Battaglini, M., (...), Sinibaldi, E., Ciofani, G. 2018 Small 14(6),1702959

"Artificial system inspired by climbing mechanism of galium aparine fabricated via 3D laser lithography" Fiorello, I., Tricinci, O., Mishra, A.K., (...), Filippeschi, C., Mazzolai, B. 2018 Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics) 10928 LNAI, pp. 168-178

"Towards ultra-responsive biodegradable polysaccharide humidity sensors" Liakos, I.L., Mondini, A., Filippeschi, C., (...), Tramacere, F., Mazzolai, B. 2017 Materials Today Chemistry 6, pp. 1-12

"Dry adhesion of artificial gecko setae fabricated via direct laser lithography" Tricinci, O., Eason, E.V., Filippeschi, C., (...), Greco, F., Mattol, V. 2017 Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics) 10384 LNAI, pp. 631-636

"Three-Dimensional Soft Material Micropatterning via Direct Laser Lithography of Flexible Molds" Bernardeschi, I., Tricinci, O., Mattoli, V., (...), Mazzolai, B., Beccai, L. 2016 ACS Applied Materials and Interfaces8(38), pp. 25019-25023

"Nanostructured ultra-thin patches for ultrasound-modulated delivery of anti-restenotic drug" Vannozzi, L., Ricotti, L., Filippeschi, C., (...), Dario, P., Menciassi, A. 2015 International Journal of Nanomedicine 11, pp. 69-92

"Two-Photon Lithography of 3D Nanocomposite Piezoelectric Scaffolds for Cell Stimulation" Marino, A., Barsotti, J., De Vito, G., (...), Mattoli, V., Ciofani, G. 2015 ACS Applied Materials and Interfaces 7(46), pp. 25574-25579