BIOGRAPHICAL SKETCH

NAME: Andrea Spanu

POSITION TITLE: Associate Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Genoa	110/110 cum laude	10/2011	Master Degree in Biomedical Engineering
University of Genoa		04/2015	PhD in Bioengineering

A. Personal Statement

(Here you can insert a short description of your professional status and achievements. Max 10 lines)

I'm a bioengineer expert in the design of innovative devices for cellular interfacing and organic transistors-based sensors, as well as the development of epidermal and textiles electrodes for biopotential detection. During my PhD and postdoc experience (that I spent between University of Genova, University of Cagliari, the IBM Almaden Research Center, San Jose, California, and at the Bruno Kessler Foundation, Trento, Italy) I developed substantial expertise on cellular interfacing and organic electronics, as well as skills in the field of chemical and physical sensing, biosensing, wearable and tattoo electronics (with a particular focus on the detection of biosignals for biomedical applications). I currently hold two courses, namely "Materials and devices for advanced sensing" at University of Cagliari (first year year of the Biomedical Engineering Master program, 45 h, 6 CFU) and Biomedical sensors at the PhD program "The Hadron Academy" (20 h). He is author of 1 patent and 40 publications in highly ranked journals, conference proceedings and books.

B. Positions and Honors

Positions and Employment

(Complete the following table. Begin with older positions. Add/delete rows as necessary.)

date1- date2	*Position*
Gen 2015-Dec 2017	*Postdoc – University of Cagliari*
Jan 2018-Jan 2019	*Researcher – Bruno Kessler Foundation, Trento, Italy*
Feb 2019-Oct 2022	*Assistant Professor (RtdA) – University of Cagliari*
Oct 2022-Feb 2025	*Assistant Professor (RtdB) – University School for Advances Studies IUSS, Pavia*
Mar 2025-Current	*Associate Professor – University School for Advances Studies IUSS, Pavia*

Honors

(Complete the following table, Add/delete rows if necessary.)

date1	*honour*
Feb 2016	*Springer Theses Award*
Sept 2025	*Doctoral award "Massimo Grattarola" – XXXI Annual School of the National Group of Bioengineering*

Patents

Application date	*Application Number*
04/02/2016	PCT/EP2016/052433 ("Organic Transistor-based system for electrophysiological monitoring of cells and method for the monitoring of the cells")

Reviewer Experience

(List the journals where you have acted as reviewer.)

- Organic electronics
- Biosensors and Bioelectronics
- Biosensors MDPI
- Scientific Reports
- TED
- Advanced Materials
- Advanced Functional Materials
- Advanced Materials Technologies
- Sensors and Actuators
- EDL
- IEEE Sensors

C. Contributions to Science

(Here you can insert a short description of your contributions to science (max 20 lines) followed by the list of the 10 most significant publications of the last 10 yrs)

During my doctorate in Bioengineering, I focused on organic electronics and neuroengineering, integrating organic biosensors and electrophysiology. I designed, manufactured and validated an in vitro cellular electrical activity sensor, the MOA (Micro OCMFET Array), based on the Organic Charge Modulated FET (OCMFET), the first field-effect organic transistor capable of detecting and amplifying cellular signals in vitro. The work on this peculiar tool resulted in a patent, and several publications in international journals and conferences. The PhD thesis won the "Springer Thesis Award" and was published in the Springer Thesis series. During my post-doctorate, I deepened the research on organic devices for biomedical applications, thanks to very formative experiences at the Nanoscale Fabrication Group of the IBM Almaden Research Center (San Jose, California) and the Bruno Kessler Foundation (Trento, Italy). During those years I worked on several projects regarding the development of a high-resolution MOAs, and the development of different types of device for 3D electrophysiological applications. These experiences allowed me to deepen my skills in the field of microfabrication and biomedical sensing, ultimately contributing to the advancement of the research on organic transistor-based chemical sensors, ultra-flexible multimodal tactile sensors for robotic applications, as well as textile and tattoable electrodes for unobtrusive biopotential monitoring. In October 2022 I joined the University School for Advanced studies - IUSS - where I currently hold the position of Associate professor. At IUSS, I co-founded the FLExible biOeletronics and Wearable devices (FLOW) Lab, an organic electronics laboratory that combines advanced sensors and wearable applications in the biomedical field, personalized medicine and smart agriculture. Here I am continuing my research in the field of cellular electrophysiology, epidermal and textile sensing, biosensors and multiparametric systems.

1 *A. Spanu, F. Viola, S. Lai, P. Cosseddu, P. C. Ricci, A. Bonfiglio, "A reference-less pH sensor based on an organic field effect transistor with tunable sensitivity". Organic Electronics 48, 188–193, doi.org/10.1016/j.orgel.2017.06.010 (2017).*

2 *F. Viola, A. Spanu, P. C. Ricci, A. Bonfiglio, P. Cosseddu, "Ultrathin, flexible and multimodal tactile sensors based on organic field-effect transistors", Scientific Reports, , 8, 8073 doi:10.1038/s41598-018-26263-1 (2018).*

3 *A. Spanu, N. Colistra, P. Farisello, A. Friz, N. Arellano, C. T. Rettner, A. Bonfiglio, L. Bozano, S. Martinoia, "A three-dimensional micro-electrode array for in-vitro neuronal interfacing." Journal of Neural Engineering, 17(3). DOI: https://doi.org/10.1088/1741-2552/ab9844, (2020).*

4 *A. Spanu, A. Botter, A. Zedda, G. L. Cerone, A. Bonfiglio, D. Pani, Dynamic surface electromyography using stretchable screen-printed textile electrodes, IEEE Transactions on Neural Systems and Rehabilitation Engineering, 29, 1661-1668, (2021).*

5 *Spanu, A., Mascia, A., Baldazzi, G., Salerno, B. F., Torrisi, F., Viola, G., ... & Pani, D. Parylene C-based, breathable tattoo electrodes for high-quality biopotential measurements. Frontiers in Bioengineering and Biotechnology, 355, DOI: 10.3389/fbioe.2022.820217, (2022).*

6 *Spanu, A., Martines, L., Tedesco, M., Martinoia, S., Bonfiglio, A., Simultaneous recording of electrical and metabolic activity of cardiac cells in vitro using an Organic Charge Modulated FET array, (2022) Front. Bioeng. Biotechnol. doi: 10.3389/fbioe.2022.945575*

7 *A. Spanu, M. Taki, G. Baldazzi, A. Mascia, R. Pietrabissa, D. Pani, P. Cosseddu, A. Bonfiglio, (2024), "Spray-coated, magnetically connectable free-standing epidermal electrodes for high quality biopotential recordings", Advanced Engineering Materials, https://doi.org/10.1002/adem.202302195.*

8 *Viola, F. A., Hatami, D., Mariani, F., Gualandi, I., Terranova, F., Scavetta, E., ... & Spanu, A. (2025). Extended gate organic field effect transistor for calcium ion sensing towards biomedical applications. Sensors and Actuators Reports, 100340.*

9 *Viola, F. A., Hatami, D., Mariani, F., Gualandi, I., Terranova, F., Scavetta, E., ... & Spanu, A. (2025). Extended gate organic field effect transistor for calcium ion sensing towards biomedical applications. Sensors and Actuators Reports, 100340.*

10 *Terranova, F., Viola, F. A., Di Lisa, D., Massobrio, P., Martinoia, S., Bonfiglio, A., & Spanu, A. (2025). Organic charge-modulated transistor for electrophysiological measurements of human-derived neurospheroids. Frontiers in Bioengineering and Biotechnology, 13, 1571011.*

D. Past and Ongoing Research Support

(Complete the following table with the list of your projects, Add/delete rows if necessary.)

From …. To ….	Project Title	Funding Agency	Role in the project
Feb 2019-Oct 2022	Search&Rescue (Emerging technologies for the Early location of Entrapped victims under Collapsed Structures and Advanced Wearables for risk assessment and First Responders Safety in SAR operations)	H2020-EU.3.7.5	Research activity supervisor
Feb 2019-Oct 2022	TEX-STYLE (Nuovi tessuti intelligenti e sostenibili multi-settoriali per design creativo e stile made-in-Italy)	MIUR, PNR 2015-2020	Research activity supervisor
Mar 2021-Dic 2021	ORGANOI3D: ORGANic charge modulated fet-based system for Optimized In vitro 3D	Ministero dello sviluppo economico and University of Genoa	Research activity supervisor

	electrophysiology		
Dec 2022-Feb 2026	ANALYSER - AN orgAnic muLti-functional sYStem for the bioelectrochemical characterization of cellular assEmblies in vitRo	MUR, 2022 PNRR	Principal Investigator

E. Experience as a research supervisor

3 postdocs

8 PhD students (4 as tutor, 4 as co-tutor)

>20 undergraduates