

# Curriculum Vitae of Matteo Pardo

Born May, 28th 1971 in Genova, Italy. Italian nationality. Two children.

Italian mother tongue, fluent in German and English, basic French.

## PRESENT POSITION

5\2008-present: Tenured researcher of the Italian National Research Council (since September 2019 working in the International Relations Office).

## PREVIOUS WORK EXPERIENCE

9\2011- 8\2019: Scientific Attaché, Italian Embassy in Berlin

6\2008-10\2010: Visiting scientist at the Max Planck Institute for Molecular Genetics Berlin (on leave from CNR).

6\2008-11\2009: Alexander von Humboldt Fellowship for experienced researchers

1\2004-5\2008: Tenure track researcher at the SENSOR Lab of the Italian National Institute for Matter Physics, then fused by law inside the National Research Council (CNR)

1\2002-12\2003: Untenured researcher at the SENSOR Lab of the Italian National Institute for Matter Physics

1\2000-12\2001: Postdoctoral fellow at the Brescia University (SENSOR Lab)

## EDUCATION

1996-1999: Brescia University, Italy; Ph.D. in Computer Engineering, with dissertation "Multivariate data analysis for gas sensors arrays".

1990-1996: Milan University, Italy; Degree in Physics (with honors). Thesis in theoretical surface physics.

1977-1990: German School Genoa (double final degree: Italian "Maturità" and German "Abitur")

## Activity as science attaché (2011-2019)

The three main dossiers I've been following in the last few years are:

**Industry 4.0.** I promoted the bilateral cooperation with the German platform for Industry 4.0, soon extended to a trilateral cooperation with France in 2017. I sit on the steering committee of the trilateral cooperation for Italy, lead the Italian efforts in WG3 "Policy supporting group", participate in WG2 "Engagement of SMEs and testbeds", and coordinate the Italian efforts altogether, in accordance with the DG for Industry of the Ministry for Economic Development. I interact on average on a weekly basis with Italian stakeholders, from industrial associations and companies to research centers, and I draft documents (trilateral roadmap; statement on data sharing plus template for the collection of use cases for data sharing; meeting agendas) and negotiate them with the French, German and EU Commission counterparts.

**European Southern Observatory.** I represent Italy, together with the President of the Italian National Institute for Astrophysics, in the board of the European Southern Observatory (ESO),

the leading intergovernmental science and technology organization in astronomy, with headquarters in Munich and three observing sites in the Atacama Desert region of Chile. ESO presently counts 16 countries and has an annual budget of circa 200 million euros, to which Italy contributes with 11%. I participate in board meetings four times a year, maintain close contacts with senior staff in ESO (e.g. administrative director, the ELT project leader), report to the Ministry of Foreign Affairs (the founding Ministry) and interact i.a. with the representative of the Finance Ministry who is sitting on the Financial Council, for a traffic of circa 300 mails per year.

***Academy of Technical Sciences.*** I promoted a meeting between the German Academy of Technical Sciences (acatech) and Italian stakeholders in the field of science and technology. The twofold aim was to remedy the Italian absence in the “European Council of Academies of Technical Sciences” (Euro-CASE) and to start the construction of an organization with the tasks of acatech in Italy. I subsequently co-promoted the creation, in 2016, of an Italian consortium between four major national research organizations and act as liaison officer between the consortium and acatech/Euro-CASE. In 2017 I handled out an agreement, which provides for the Italian consortium to participate in Euro-CASE as an associate member for two years. I analyzed the experiences of acatech and of the French and British academies on statute, budget, main dossiers followed, and organizational structure, developing a living document that is serving for the establishment of the Italian academy.

Other tasks have been:

- *Organization of bilateral events in science and technology.* I organized 3-4 events per year, taking care of every aspect: finding German partners willing to contribute financially, topic and speakers selection (up to 50 for bigger events), practical secretariat. Events ranged from specialist 1-day symposia (e.g. Seismic Risk Reduction; Biological and Medical Research Infrastructures; Technology and infrastructures for Cultural Heritage), to two-days workshops uniting science, industry and institutions (e.g. on tech startups; smart cities), to shorter outreach events for the general public (e.g. Evening with astronaut Samantha Cristoforetti; Italian scientists leading research infrastructures in Germany; Italian Research Day in Germany).
- *Outreach activities.* I regularly have contacts with the Italian and German press (and often co-draft press statements) on the occasion of our outreach activities, of institutional visits, of Italian participations in major fairs, of industry 4.0 trilateral meetings. Every year I give a seminar on “Italy's innovation policy” at the Berlin Technical University.
- *Communications to Italy.* I have prepared dossiers (the longer ones on the German research system, on industry 4.0 in Germany, on researchers’ mobility in and out of Germany) and briefer information notes (circa 20 per year) for the Ministry of Foreign Affairs in Rome and other Italian stakeholders.
- *Support to the international activity of Italian research institutions and enterprises.* Major dossiers I promoted and accompanied were MoUs between The Italian National Research Council and Max Planck and between CNR and Helmholtz, including joint sectorial workshops and exchange of researchers.
- *Coordination of the group of Science Attachés in Berlin.* Since 2013 I’ve been responsible for the network of circa 60 Science Attachés. For example, I arranged a meeting series with the 7 DGs of the German Ministry for Education and Research (BMBF). Other meetings have been, for instance, with the presidents of the Technical University Berlin and of the German Academy of Technical Sciences.
- *Visits to Germany of Italian institutional delegations.* I arranged three visits of Italian Education, University and Research Ministers, either bilaterally with the corresponding German Minister or inside the G7 of Science Ministers. My tasks include agenda setting with

the German counterpart, the preparatory documents for the Minister, and sometimes, as in the case of the G7 meeting, the co-drafting of communiqués (for the G7, on poverty-related infectious diseases, the future of the seas and oceans, clean energy, and research infrastructures). Moreover, I arrange supplemental side-meetings with German stakeholders. I also curated i.a. the visit of a parliamentary commission and of a major Italian company to the industry 4.0 cluster in Stuttgart, accompanied presidents of national research institutions (CNR, INFN) and rectors to the German Ministry, to the Global Research Council, to the G8 of Science Academies.

- *Relationship with the community of Italian researchers in Germany.* I set up a network (database) of circa 250 Italian researchers in Germany. I gave particular care to a group of senior scientists across disciplines, whose advice I have drawn upon in several occasions.

## Activity as researcher (1997-2011)

I was responsible for the data analysis activity within the SENSOR Lab, a leading international laboratory in the field of chemical sensing and artificial olfaction (aka e-nose), part of the National Research Council and located in Brescia (region Lombardy).

At first as PhD student, then with up to two PhD students and a technician, I have built up from scratch the laboratory's data analysis skills. From the second year of post-doc, I have also coordinated the experimental activity on artificial olfaction, with a graduate technician, a postgraduate researcher and several graduate students.

In several national and international e-nose projects I collaborated with extremely interdisciplinary teams: with computer scientists, statisticians, engineers and physicists on data analysis techniques, with chemists and chemical engineers for the comparison of the electronic nose with classical analytical methods for the characterization of gaseous mixtures, and with specialists in various application fields, such as food scientists, environmental engineers, agricultural engineers and medical doctors.

Starting 2005 I applied pattern recognition techniques in molecular biology, mainly inside collaborations with two Max Planck Institutes in Berlin. I dealt with multivariate gene selection for microarray, with combinations of filters and gene subset search methods, and with the integration of multiple high throughput data sets.

I tackled all three aspects of data analysis: *Explorative analysis* (filtering, summary statistics, plots), *Preprocessing* (drift correction, feature extraction and feature selection), *Supervised learning* (both with chemometrics and pattern recognition techniques, such as PLS, kNN, LDA, and with more advanced machine learning techniques, like multilayer perceptrons, support vector machines and ensembles of learning machines). I pioneered the application of SVM, boosting and random forests to the analysis of e-nose data.

## QUALIFICATIONS

### **Teaching.**

#### Undergraduate

- 1998-2002: Teaching assistant at the Engineering faculty in Brescia for different *Physics* courses (Electro and Magnetostatics, Waves, Introductory Solid State Physics).
- 2003-2006: Adjunct professor for two full courses per year at the Medicine faculty in Brescia (*Computers for Medicine at 1<sup>st</sup> and 3<sup>rd</sup> bachelor year*).

- 2008/09: *Statistical methods in genetics and bioinformatics: Pattern Recognition* at the Freie Universitaet Berlin, Master in Bioinformatics (6 credits)

### Graduate

- Several short courses on Statistical Pattern Recognition and Bioinformatics and DNA microarray data analysis at the University of Brescia.
- 2007: PhD course on *Advanced Pattern Recognition*, Faculty of Physics, University of Barcelona, Spain.
- 2009: PhD course on *Pattern Recognition for Genomics*, Università di Roma “La Sapienza”
- 2009: Seminars cycle *Introduction to Pattern Recognition*, Chinese Academy of Sciences and German Max Planck Society Partner Institute for Computational Biology, Shanghai, China

### Schools

- 2004: Director of the *Short Course on Fundamentals of signal and data processing* for the 2<sup>nd</sup> EU Network of Excellence on Artificial Olfactory Sensing

### **Programming Languages.**

Fluent in Matlab and R, basic Perl.

### **Invited talks and seminars.**

- 9 invited talks at international conferences, between which a keynote and a plenary talk.
- Invited seminars at University of Palermo, Illinois Institute of Technology, CNRS & UFR biomédicale de l'Université Paris V, Semiconductor Physics Institute in Vilnius, Warwick University, Department of Informatics at University of Bergen.

### **Editorial activity.**

- For the 13th International Symposium on Olfaction and Electronic Noses I edited the Proceedings for the American Institute of Physics and a special issue with selected papers for Sensors and Actuators B: Chemical (Volume 146, Issue 2, 29 April 2010).
- 2011-2014: member of the Editorial Board of Journal of Sensors.

### **Scholarships & Awards.**

- Scholarship for post-graduation studies from the German Academic Exchange Council (DAAD) for distinguished graduation from the German School; May 1990.
- Wolfgang Goepel Memorial Award for the best contribution at The 10th International Symposium on Olfaction and Electronic Nose (ISOEN 2003), Riga, Latvia; June 2003
- Von Humboldt Fellowship for Experienced Researchers for the project “Joint Analysis of genomic datasets for Cancer Screening”, at the Department for Computational Molecular Biology, Max Planck Institute for Molecular Genetics, Berlin, 6/08 – 11/09

### **Committees.**

- Member of technical program committee: 11th International Symposium on Olfaction and Electronic Noses (ISOEN11, 2005) and 11th International Meeting on Chemical Sensors (IMCS11, 2006)
- Technical program chair: 13th International Symposium on Olfaction and Electronic Noses (ISOEN13, 2009).
- 2009-2015: Member of steering committee, International Society for Olfaction and Chemical Sensing (ISOCS)

### **Short stays abroad.**

- 1-3 months each at: 1) Applied Physics Group, Linkoping University, Sweden (with a grant from the Italian National Research Council and a grant from the European Network of Excellence “Nose”), working on drift correction; 2) California Institute of Technology,

working on sensor selection and classifier comparison; 3) Illinois Institute of Technology and Argonne National Labs, working on the analysis of hybrid array data; 4) University of Warwick, working on feature selection.

- 9 months in 05-07: Max Planck Institute for Molecular Genetics, Berlin, working on feature selection for microarray data and on the integration of high throughput molecular biology datasets.
- 9\09-10\09: Chinese Academy of Sciences and German Max Planck Society Partner Institute for Computational Biology, Shanghai, working on primate comparative genomics.

### **Projects.**

I performed the analysis of e-nose data produced at the Sensor Lab in Brescia in four EU projects and seven national projects (two of them financed by industry). I was PI in two major projects:

**Industry.** In 2002, the Sensor Lab know-how was transferred to the multinational corporation SACMI (Imola), which engineered and marketed an artificial olfactory system. I supervised the technology transfer project and, together with a PhD student, I developed a user-friendly data analysis package, which was incorporated into the SACMI tool. The strong application interest of the electronic nose led to several other industrial collaborations, especially with food-tech companies, and ultimately to two patents.

**EU.** STREP Project FP6 'Mobile system for non-invasive wound state monitoring' (WOUNDMONITOR), 01/2006 - 06/2009. I was responsible for the data analysis of the whole project (leader of two work packages). I wrote the proposal for the Sensor Lab, sat in the steering committee, and wrote -or supervised the writing- of all deliverables and reports.

## PUBLICATIONS

I authored 30 journals papers, of which 16 in Sensors and Actuators B and 4 in IEEE Sensors Journal, that were (standing 2012), respectively, number 3 and 17 (out of 58) in impact factor ranking for the subject category "Instruments & Instrumentation", as determined by ISI's Journal Citation Report. Sensors and Actuators B, which is in the first quartile also in its other two categories "Analytical Chemistry" and "Electrochemistry", is widely recognized to be the top journal in the chemical sensor area.

Restricting for brevity the field to the 16 papers in Sensors and Actuators B, I'm the first author in 9, while in 5 the first authors were PhD students /postdocs in the Artificial Olfaction group I was leading.

In the "Evaluation of the Quality of Research 2004-2010", performed by the Italian National Agency for the Evaluation of University and Research (ANVUR), my six selected papers all received the top mark 1 (meaning excellent both for the quality of the journal and for the numbers of citations received).

My last paper has been published in May 2018 (I contributed with a gene selection analysis, performed back in 2010) in Cell Host & Microbe.

I co-edited one book ("Intelligent Systems: Techniques and Applications"), contributed to three book chapters and have circa 90 conference contributions.