PERSONAL INFORMATION   Gianluca Di Flumeri

WORK EXPERIENCE

01/09/2020 – Present   **EU expert reviewer**

Research Executive Agency, European Commission

Expert reviewer of proposals submitted at the following calls:

▪ Horizon 2020 Marie Skłodowska-Curie Actions (H2020-MSCA-IF-2020).

01/11/2017 – Present   **Postdoctoral Fellowship**

Department of Molecular Medicine
Sapienza University of Rome, Rome (Italy)

▪ Researcher in the study of human electrophysiological signals such as Electroencephalogram (EEG), Electrooculogram (EOG), Electrocardiogram (ECG) and Skin Conductance (SC-GSR), for the determination and assessment of human mental states and cognitive processes (mental workload, stress, vigilance, cognitive training, etc.) on professional figures (air traffic controllers, aircraft pilots, car drivers, robot-assisted surgeons, etc.)

Participation to research projects:
▪ SAFEMODE (Strengthening synergies between Aviation and maritime in the area of human Factors towards achieving more Efficient and resilient MODE of transportation); EU Horizon 2020 RIA on topic SOCIETAL CHALLENGES - Smart, Green And Integrated Transport, from 2019 to 2022.
▪ STRESS (Human Performance Neurometrics Toolbox For Highly Automated Systems Design); EU Horizon 2020 SESAR Joint Undertaking Research and Innovation Action, from 2016 to 2018.
▪ MOTO (the embodied reMOte TOwer); EU Horizon 2020 SESAR Joint Undertaking Research and Innovation Action, from 2016 to 2018.

01/04/2014 – Present   **Bioengineer Researcher**

BrainSigns Srl, Rome (Italy) - http://www.brainsigns.com/

▪ Project Management.
▪ Researcher in Cognitive Neurosciences applied to operational environments and Human Factor.
▪ Researcher in Neuromarketing.
▪ Developer of Matlab Graphical Interfaces (GUIs) for neurophysiological studies in Neuroscience.
▪ Collaboration in the development of devices for the determination of human cognitive and emotional states by measuring biosignals.
▪ Data scientist.

Participation to research projects:
▪ MINDTOOTH (Wearable device to decode human mind by neurometrics for a new concept of smart interaction with the surrounding environment); EU Horizon 2020 Fast-Track-to-Innovation Action, from 2020 to 2022.
▪ SIMUSAFE (SIMUlation of behavioural aspects for SAFEr transport); EU Horizon 2020 Research and Innovation Action, from 2017 to 2021.
▪ MINIMA (Mitigating Negative Impacts of Monitoring high levels of Automation); EU Horizon 2020 SESAR Joint Undertaking Research and Innovation Action, from 2016 to 2018.

01/01/2015 – Present   **Visiting Bioengineer Researcher**

Neuroelectrical Imaging and BCI Lab - IRCCS "Fondazione Santa Lucia", Rome (Italy)

▪ Researcher in the study of human electrophysiological signals (EEG, EOG, ECG, GSR), for the determination of mental states, learning processes and Human Factors in general in operational environments.

11/2012 – 06/2017	**Technical trainer**

Dirigi Srl, Foggia (Italy)

▪ Certified teacher, for account of the Texa Spa of Monastier di Treviso (TV - Italy) by Accredia, for the provision of a course on the basic physical and constructive principles of air conditioning systems in the cars, linked to the dangers of fluorinated gases (greenhouse effect), and consequently the correct behavior in activities of maintenance, in accordance with Regulation CE 307/2008 and Presidential Decree (IT) 43/2012. More than 20 courses provided and 250 operators certified.

EDUCATION AND TRAINING

08/2017 – 10/2017	**PhD Student – Abroad period**	PhD Degree

Department of Human Factors
Institut Supérieur de l'Aéronautique et de l'Espace (ISAE-SUPAERO), Toulouse (France)

▪ Evaluation of aircraft pilots' mental states, by combining EEG and fNIRs technologies, in simulated and real environments..

11/2014 – 10/2017	**PhD in Biophysic (Morphogenesis & Tissue Engineering)**	PhD Degree

Department of Anatomical, Histological, Forensic & Orthopedic Sciences
Sapienza University of Rome, Rome (Italy)

▪ Application of neuroscientific techniques for the study and evaluation of human mental states in operational environments.

Thesis title:
▪ Electroencephalography-based measures of human mental workload in operational environments for the development of passive Brain-Computer Interfaces.

Participation to research projects:
▪ NINA (Neurometrics Indicators for ATM); EU FP7 SESAR WPE Project, from 2013 to 2016.

09/2011 – 21/03/2014	**Biomedical Engineer – Final Grade 110/110**	2nd level degree - Master

Sapienza University of Rome, Rome (Italy)

▪ Biophysics (biomechanics, biochemistry, biomaterials, electrophysiology, neurophysiology, models of biological systems).
▪ Measurement (sensors, mechanical measur., electrical measur.).
▪ Advanced techniques for acquisition and processing of biological signals.
▪ Advanced biomedical instrumentation (ECO, CT, NMR).

09/2011 – 02/2012	**Semester abroad: Biomedical Engineering**	Erasmus Program

Escola Universitària d'Enginyeria Tècnica Industrial de Barcelona (EUETIB)
Universitat Politecnica de Catalunya, Barcelona (Spain)

▪ Exams (all passed): Biology, Signal processing, Electrical measurements, Biomechanics
▪ Projects carried out:
  ▫ realization of an electronic circuit for signals acquisition to measure the blood pressure, using a pressure sensor and a piezoelectric microphone, and consequently an appropriate Matlab script for data processing;
  ▫ biomechanical study of human walking.

| 09/2007 – 19/07/2011 | **Clinical Engineer** | 1st level degree - Bachelor |

Sapienza University of Rome, Rome (Italy)

▪ Mathematics (Analysis, Algebra, Statistic). Physics (dynamics, kinematics, thermodynamics, electromagnetic, applied, mechanics, fluids). Chemistry.
▪ Electrical engineering (circuits sizing, engines schemes), Electronics (Analog and Digital).
▪ Informatics.
▪ Biomedical instrumentation.Principles of acquisition and signal processing.

| 09/2003 – 06/2007 | **Maturità Classica – Final Grade 100/100** | Italian secondary school diploma |

Liceo Classico "Vincenzo Lanza", Foggia (Italy)

PERSONAL SKILLS

Mother tongue(s)   Italian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	B2	C1	B2	B2	B2
Spanish	C1	C1	C1	B2	B2
	Diploma de Español como Lengua Extranjera (DELE) - B2				
French	A2	B1	A2	A2	A2

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user
Common European Framework of Reference for Languages

Communication skills

▪ Excellent communication skills due to the large experience in projects preparation and presentation and research dissemination (conferences, workshops, teaching assistant)
▪ Strong team spirit, due to a favorable character and the many team sports practiced.
▪ Excellent ability to adapt to multicultural environments, gained through study abroad.

Organisational / managerial skills

▪ Large experience in Project Management.
▪ Data management strategies.
▪ Proficiency in developing WorkPlans, GANTT and PERT charts.
▪ Team building and coordination.
▪ Management of laboratory instrumentation and infrastructure.
▪ In general, accuracy, punctuality, order, methodical and organizational skills among my main character traits.

Computer skills

▪ Office Suite and Microsoft tools (Word, Excel, PowerPoint, Outlook, Teams).
▪ Proficiency in MATLAB (including GUIs and Compiler).
▪ Google tools and services (Gmail, GCalendar, GDrive, GMeet).
▪ Cloud and data-storage softwares (Dropbox, Mega, Seafile, Box).
▪ SPSS, Statistica and R softwares for Statistical Analysis.
▪ Teleconference softwares (Teams, GMeet, GoToMeeting, WebEx, Skype, Zoom).
▪ Basic knowledge of Ansys Fluent (fluid dynamics), Labview, Kinovea (biomechanics), PhotoShop.

Job-related skills	▪ Experience in laboratory experiments in terms of:

▪ Experience in laboratory experiments in terms of:
  ▫ design of electronic circuits for measurement instrumentation;
  ▫ acquisition and processing of biomedical signals;
  ▫ experimental design;
  ▫ design and development of data processing algorithms;
  ▫ statistical analysis.
▪ Great expertise in the field of cognitive neuroscience, in particular regarding Mental states evaluation in operational environments and Neuromarketing.
▪ Expertise in systems for the acquisition of biological signals of various kinds, developed during the thesis and the current research experience (within the parentheses the instrumentation used):
  ▫ EEG (EBNeuro Galileo BEMicro/BE+, Software Galileo NT, Vision Analyzer, g.Tec devices, BrainProducts devices, Neuroelectrics Enobio);
  ▫ HR, GSR (skin conduttance), skin temperature (MindMedia NeXus-4/10, Empatica E4, Shimmer 3);
  ▫ EyeTracking (ASL Mobile Eye XG, Tobii).
▪ Data analysis (data mining, machine-learning, statistical analysis, etc.).

Driving licence	▪ B

ADDITIONAL INFORMATION

Publications (Top ten)	

▪ **Di Flumeri, G.**, De Crescenzio, F., Berberian, B., Ohneiser, O., Kramer, J., Aricò, P., ... & Piastra, S. (2019). Brain–Computer Interface-Based Adaptive Automation to Prevent Out-Of-The-Loop Phenomenon in Air Traffic Controllers Dealing With Highly Automated Systems. Frontiers in human neuroscience, 13. DOI: https://doi.org/10.3389/fnhum.2019.00296.

▪ **Di Flumeri, G.**, Aricò, P., Borghini, G., Sciaraffa, N., Di Florio, A., & Babiloni, F. (2019). The Dry Revolution: Evaluation of Three Different EEG Dry Electrode Types in Terms of Signal Spectral Features, Mental States Classification and Usability. Sensors, 19(6), 1365. DOI: https://doi.org/10.3390/s19061365.

▪ **Di Flumeri, G.**, Borghini, G., Aricò, P., Sciaraffa, N., Lanzi, P., Pozzi, S., ... & Babiloni, F. (2018). EEG-based mental workload neurometric to evaluate the impact of different traffic and road conditions in real driving settings. Frontiers in human neuroscience, 12, 509. DOI: https://doi.org/10.3389/fnhum.2018.00509.

▪ G. Borghini, P. Aricò, **G. Di Flumeri**, F. Babiloni. "Industrial Neuroscience in Aviation: Evaluation of Mental States in Aviation Personnel". Byosystems and Biorobotics, 2017, Springer International Publishing. ISBN: 978-3-319-58598-7. DOI: 10.1007/978-3-319-58598-7. **(BOOK)**

▪ P. Aricò, G. Borghini, **G. Di Flumeri**, N. Sciaraffa, A. Colosimo, F. Babiloni. "Passive BCI in Operational Environments: Insights, Recent Advances, and Future Trends". IEEE Transactions on Biomedical Engineering, 2017; 64: 7, IEEE. DOI: 10.1109/TBME.2017.2694856.

▪ P. Aricò, G. Borghini, **G. Di Flumeri**, S. Bonelli, A. Golfetti, I. Graziani, S. Pozzi, JP Imbert, G. Granger, R. Benhacene, D. Schaefer, F. Babiloni. "Human Factors and Neurophysiological Metrics in Air Traffic Control: a Critical Review". IEEE Reviews in Biomedical Engineering, 2017; IEEE. DOI: 10.1109/RBME.2017.2694142.

▪ G. Borghini, P. Aricò, **G. Di Flumeri**, N. Sciaraffa, A. Colosimo, MT Herrero, A. Bezerianos, NV Thakor, F. Babiloni. "A New Perspective for the Training Assessment: Machine Learning-Based Neurometric for Augmented User's Evaluation". Frontiers in Neuroscience, 2017; 11: 325, Frontiers. DOI: 10.3389/fnins.2017.00325.

▪ G. Borghini, P. Aricò, **G. Di Flumeri**, G. Cartocci, A. Colosimo, S. Bonelli, A. Golfetti, JP Imbert, G. Granger, R. Benhacene, S. Pozzi, F. Babiloni. "EEG-based cognitive control behaviour assessment: an ecological study with professional air traffic controllers". Scientific Reports, 2017; 7: 547, Nature Publishing Group. DOI: 10.1038/s41598-017-00633-7.

▪ P. Aricò, G. Borghini, **G. Di Flumeri**, A. Colosimo, S. Bonelli, A. Golfetti, S. Pozzi, JP Imbert, G. Granger, R. Benhacene and F. Babiloni. Adaptive automation triggered by EEG-based mental workload index: a passive brain-computer interface application in realistic air traffic control environment. Frontiers in human neuroscience, 2016, 10. DOI: 10.3389/FNHUM.2016.00539

▪ P. Aricò, G. Borghini, **G. Di Flumeri**, A. Colosimo, S. Pozzi, and F. Babiloni. "A passive brain–computer interface application for the mental workload assessment on professional air traffic controllers during realistic air traffic control tasks", Progress in Brain Research, Brain-Computer Interfaces: Lab Experiments to Real-World Applications. 2016, 228: pp. 295-328. DOI: 10.1016/bs.pbr.2016.04.021.

Patents	• P. Aricò, G. Borghini, **G. Di Flumeri**, F. Babiloni. "Method for estimating a mental state, in particular a workload, and related apparatus". Nr. EP3143933 A1, 22/03/2017.

Editorial activity/Scientific events
- 42 certified peer reviews so far (retrieved the 11/10/2020 from Publons).
- Review Editor (from 2020) of the new peer-reviewed journal 'Frontiers in Neuroergonomics' (sezione "Social Neuroergonomics") by Frontiers Media SA (Lausanne, Switzerland).
- Guest Associate Editor (from 2020) of the peer-reviewed journal 'Frontiers in Human Neuroscience' (IF: 2.87, section 'Brain-Computer Interfaces') by Frontiers Media SA (Lausanne, Switzerland). Leading the Research Topic "Real-World Applications of Neurophysiological Monitoring for Passive Brain-Computer Interfaces".
- Review Editor (from 2019) of peer-reviewed journal 'Frontiers in Physiology' (IF: 3.20, section "Computational physiology and medicine") by Frontiers Media SA (Lausanne, Switzerland).
- Topic Editor (from 2019) of peer-reviewed journals 'Sensors' (IF: 3.03) and 'Brain Sciences' (IF: 2.79), by MDPI (Basel, Switzerland).
- Guest Editor of the Special Issue "Brain Plasticity, Cognitive Training and Mental States Assessment" on Brain Sciences, MDPI (2019)
- Guest Editor of the Special Issue "EEG Electrodes" on Sensors, MDPI (2018)

- Local organizer and Scientific Committe of the Third International Conference "H-WORKLOAD 2019" (Rome, 14-15/11/2019).

Courses
- Health technologies and processes: planning, scheduling and control systems. (05/04/14)

Grants/Awards
- Avvio alla ricerca 2020, individual research grant (2000 €) funded by Sapienza University of Rome for the project "NEUROSIM – NEUROphysiological evaluation of SIMulators effectiveness at driving school to improve safety, reduce costs and pollution".
- Avvio alla ricerca 2017, individual research grant (1000 €) funded by Sapienza University of Rome for the project "DriveME – Driver Mental workload Evaluator".
- Avvio alla ricerca 2016, individual research grant (1000 €) funded by Sapienza University of Rome for the project "UFEEL – User's Feelings nEurophysiological EvaLuator".

- SESAR Young Scientist Award 2018, recognizing the remarkable contribute, among young researchers, to the scientific research of the aviation and air traffic control domains. Dr. Gianluca Di Flumeri ranked first, because of the great innovation and potential of his work, focused on the application of electroencephalographic measures of mental workload for the development of Brain-Computer Interfaces to use in operational environments.
- MINERVA award 2017, the Dr. Di Flumeri's research activity has distinguished, among all the PhD students of Sapienza University in the field of life sciences, by providing a very forefront contribute to the international scientific community, and producing a wide appeal and appreciation.
- "I Guidoniani" Scientific Award 2015, as the better scientific study presented at the XXVIII Annual Conference of the Italian Society of Aerospace Medicine (AIMAS), 2015, 1st – 3th July; Milan, Italy. "Mental workload evaluation of ATCOs during ecological ATM scenarios"
- 2014 SISS Young Researchers, V Conference of the Italian Sensory Science Society, Fondazione Edmund Mach, San Michele all'Adige (TN); Italy, 26-28 November 2014. "Uno studio elettroencefalografico della percezione odorosa in soggetti giovani"

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FIRMATO
Gianluca Di Flumeri