PhD in Information Technology and Electrical Engineering
Università degli Studi di Napoli Federico II

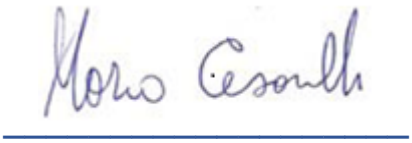
PhD Student: Danilo Calderone

Cycle: 37th

Training and Research Activities Report

Year: First

Tutor: Prof. Mario Cesarelli



Co-Tutor: Prof. Fabrizio Clemente

Date: December 12, 2022

1. Information:

- **PhD student: Calderone Danilo**
- **DR number: DR996114**
- **Date of birth: 14/10/1996**
- **Master Science degree: Biomedical Engineering**
- **University: Università degli Studi di Napoli "Federico II"**
- **Doctoral Cycle: 37th**
- **Scholarship type: *MUR PON***
- **Tutor: Prof. Mario Cesarelli**
- **Co-tutor: Prof. Fabrizio Clemente**

2. Study and training activities:

Activity	Type[1]	Hours	Credits	Dates	Organizer	Certificate[2]
Ultra High Field Magnetic Resonance Imaging	Ad hoc course	6h	3	17/1/2022 – 31/1/2022	Prof. Giuseppe Ruello	Y
Statistical data analysis for science and engineering research	Ad hoc course	14h	4	22/3/2022 – 28/5/2022	Prof. Roberto Pietrantuono	Y
Big Data Architecture and Analytics	Ad hoc course	18h	5	6/4/2022 – 28/7/2022	Prof. Giancarlo Sperlì	Y
Biosignals measurement and analysis	Ad hoc course	16h	4	15/6/2022 – 13/7/2022	Dr. Emilio Andreozzi	Y
Data Science for Patient Records Analysis	Ad hoc course	12h	3	15/6/2022 – 29/7/2022	Prof. Marcello Cinque	Y
Interaction Control in Surgical and Rehabilitation Robotics	Ad hoc course	12h	2,4	20/10/22 – 23/10/22	Associate Prof. Ficuciello Fanny	Y
Systems biology as a compass to understand tumor-immune interactions in humans	Seminar	1,5h	0,3	2/2/2022	MD Bedognetti Davide	N

The learning landscape in deep neural networks and its exploitation by learning algorithms	**Seminar**	**1,5h**	**0,3**	**21/1/2022**	**Prof. Zecchina Riccardo**	**N**
Computational analysis of cancer genomes	**Seminar**	**1,5h**	**0,3**	**16/2/2022**	**Prof. Nùria Lòpez-Bigas**	**N**
Bench to Bytes to Bedside: Converting genomic data into healthcare Tools	**Seminar**	**1,5h**	**0,3**	**4/03/2022**	**Prof. Serena Nik-Zainal**	**N**
Towards a political philosophy of AI	**Seminar**	**2h**	**0,4**	**11/4/2022**	**Prof. Mark Coeckelbergh**	**N**
An Introduction to Deep Learning for Natural Language Processing	**Seminar**	**1h**	**0,2**	**13/4/2022**	**Dr. Marco Valentino**	**N**
Explainable Natural Language Inference	**Seminar**	**1,5h**	**0,3**	**13/4/2022**	**Dr. Marco Valentino**	**N**
Using delays for control	**Seminar**	**1h**	**0,2**	**21/4/2022**	**Prof. Emilia Fridman**	**N**
On using simple optimization techniques for tuning of UAVs	**Seminar**	**2h**	**0,4**	**27/4/2022**	**Associate Prof. Dariusz Horla**	**N**
Assessing postural control and motion sickness using electrophysiological signals	**Seminar**	**2h**	**0,4**	**26/4/2022**	**Prof. Paolo Gargiulo**	**N**
Probing and infusing biomedical knowledge for pre-trained language models	**Seminar**	**2h**	**0,4**	**7/6/2022**	**Dr. Zaiqiao Meng**	**N**
Accelerating target identification and drug discovery through the power of high scale human genetics	**Seminar**	**1h**	**0,2**	**20/6/2022**	**PhD Giusy Della Gatta**	**N**

Symbiotic Control of Wearable Soft Suits for human motion assistance and augmentation	**Seminar**	**2h**	**0,4**	**20/5/2022**	**Prof. Lorenzo Masia**	**N**
Assessing postural control and motion sickness BioVRsea paradigm	**Seminar**	**2h**	**0,4**	**11/10/2022**	**Prof. Paolo Gargiulo**	**N**
New paradigms for 3D modelling and surgical planning	**Seminar**	**2h**	**0,4**	**13/10/2022**	**Prof. Paolo Gargiulo**	**N**
Durability of fuel-cell systems	**Seminar**	**2h**	**0,4**	**30/11/2022**	**Prof. Elodie Pahon**	**N**

1) Courses, Seminar, Doctoral School, Research, Tutorship
2) Choose: Y or N

2.1. Study and training activities - credits earned

	Courses	Seminars	Research	Tutorship	Total
Bimonth 1	**3**	**0,9**	**5**	**0**	**8,9**
Bimonth 2	**0**	**2,2**	**6**	**0**	**8,2**
Bimonth 3	**4**	**1**	**7**	**0**	**12**
Bimonth 4	**12**	**0**	**7**	**0**	**19**
Bimonth 5	**2,4**	**0,8**	**7**	**0**	**10,2**
Bimonth 6	**0**	**0,4**	**6**	**0**	**6,4**
Total	**21,4**	**5.3**	**38**	**0**	**64,7**
Expected	**20 - 40**	**5 - 10**	**10 - 35**	**0 – 1,6**	

3. Research activity:

Research activity aimed at studying and creating innovative models and tools for ICT based healthcare. The primary objective is to include medical devices and diagnostic aids in clinical practice. The complementary objective is to study technologies and organizations to experiment with ICT-based models in healthcare also in response to the needs that emerged from the COVID 19 pandemic.
In this year, the research was focused in developing these telemedicine and 3D-printing based activities:
- Definition of generical process indicators for the quality measurement of an active telemedicine service
- Study of the state of the art and the regulatory framework of telemedicine and homecare services
- Management, Quality measurement and technological research for a pediatric telemonitoring project
- Study of 3D Printing techniques, CAD modelling and segmentation softwares (3DSlicer)

- Use of 3D Printing for supporting orthopedic surgeons and neurosurgeons in pre-operative planning and surgery simulation using patient's 3D Printed anatomical models
- Use of 3D Printing for supporting the otological surgery for cochlear implants

4. Research products:

Papers:
1) "Guardian Angel 2.0: A telemedicine service for children with home mechanical ventilation"
Authors: Anna Dolcini, Luigi Iuppariello, Danilo Calderone, Mario Cesarelli, Fabrizio Clemente
Journal of publication: "Revue Roumaine Des Sciences Techniques Série Électrotechnique Et Énergétique", status: published, 2022

2) "Use of Three-Dimensional Printing Technology for Supporting the Hip Reconstruction Surgery in Paediatric Patients", status: to be submitted

3D Printed anatomical models:
2 anatomical models for the orthopaedics (1 paediatric hip bone and 1 tibia and foot bones)
2 anatomical models for the neurosurgery (1 spine bones section and 1 skull bones)

5. Conferences and seminars attended

1) Expert3D course: 3D Printing and its clinical implementations, IA applied on medical images
2) IA Conference in Barcelona (from Expert3D)

6. Activity abroad:

None

7. Tutorship

None