UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

DOTTORATO DI RICERCA / PHD PROGRAM IN
INFORMATION TECHNOLOGY AND ELECTRICAL ENGINEERING

Activities and Publications Report

PhD Student: Giovanni Stanco

Student ID: DR993896

PhD Cycle: XXXV
PhD Cycle Chairman: Prof. Stefano Russo

PhD program student's start date: 01/11/2019
PhD program student's end date: 31/10/2022

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PhD scholarship funding entity: RisLab – Laboratorio di Ricerca e Innovazione per la Sicurezza S.r.l.

General information

Giovanni Stanco received in 2019 the Master Science degree in Telecommunications Engineering from the University of Napoli Federico II. He attended a curriculum in Computer and Communications engineering within the PhD program in Information Technology and Electrical Engineering. He received a grant from Rislab SRL.

Study activities

Attended Courses

Year	Course Title	Type	Credits	Lecturer	Organization
1st	Intelligenza artificiale ed etica	Ad hoc course	1.6	Prof. Prevete	ITEE
1st	Scientific programming and visualization with Python	Ad hoc course	2	Prof. Botta	DIST
1st	Innovation Management, entrepreneurship and intellectual property	Ad hoc course	5	Prof. Rippa	ITEE
1st	Protocolli per reti mobili	MSc course	6	Prof. Avallone	DIETI
1st	Machine learning	Ad hoc course	4	Proff. Sansone, Corazza	ITEE
1st	Network Security	MSc course	6	Prof. Romano	DIETI
1st	Software security per sistemi industriali	MSc course	3	Proff. Cotroneo, Natella	DIETI
1st	Strategic orientation for STEM research and writing	Ad hoc course	3.6	Dr. Fraser	ITEE
2nd	Statistical data analysis for science and engineering research	Ad hoc course	4	Prof. Pietrantuono	ITEE
3rd	Version control with Git	Ad hoc course	1.2	Dr. Robin Long	Lancaster University
3rd	Introduction to the Linux Command Line	Ad hoc course	1.2	Dr. Robin Long	Lancaster University

Attended PhD Schools

Year	School title	Location	Credits	Dates	Organization
3rd	UK Cyber Security PhD Winter School		4	10-12/1/22	University of Surrey
3rd	"Jacob T. Schwartz International School for Scientific Research -	Lipari (ME)	6	4-10/7/22	UNICT

	Lipari School on Advanced Networking Systems" entitled Programmability, Security, and Algorithmic Challenges in Future Networks				

Attended Seminars

Year	Seminar Title	Credits	Lecturer	Lecturer affiliation	Organization
1st	Introduction to Cern and wakefield measurement at Clear	0.2	Proff. Arpaia, Gilardi	DIETI	ITEE
1st	Deep learning onramp	0.4	Prof. Sansone, ing. Marrone	DIETI	ITEE
1st	Marked point processes for object detection	0.2	Prof. Zerubia	Inria	ITEE
1st	Cybersecurity and fuzzing for robots	0.2	Dr. Iannillo	University of Luxembourg	ITEE
1st	Computational Biology	0.2	Prof. Ceccarelli	DIETI	ITEE
1st	Elettromagnetismo e salute	0.2	Prof. Massa	UNINA	ITEE
1st	How to get published with IEEE	0.4	Dr. Lukacs	IEEE	ITEE
1st	Large scale training of deep neural networks	0.4	Dr. Frameni, Prof. Sansone		ITEE
1st	La programmazione europea e la ricercar	0.4	Prof. Ammirati		ITEE
1st	Planning 5G under EMF constraints	0.4	Prof. Cacciapuoti	DIETI	ITEE
1st	SPS webinar series: SPACE	0.4	Dr. Giryes		
1st	CVPL: bias from the wild	0.4	Proff. Cristianini, Frontoni		
1st	CVPL: adversial attacks on image classifiers	0.4	Proff. Cavallaro, Frontoni		
1st	CVPL: learining representations and geometry from unlabelled videos	0.4	Prof. Vevaldi		

1st	How to publish OpenAccess with IEEE	0.2		IEEE	
2nd	AI4NETS – AI/ML for data communication networks	0.6	Dr. Casas		ITEE
2nd	GDPR basics for computer scientists	0.3	Prof. Bonatti	DIETI	ITEE
2nd	Digital project management	0.2	Prof. Carotenuto		ITEE
2nd	Images, Texts, emojis and geodata ina a sentiment analysis pipeline	0.3	Dr. Pelosi		ITEE
2nd	At the Nexus of Big Data, Machine Learning, and Human Cognition	0.2	Prof. Djorgovski	Caltech	ITEE
2nd	Exploiting Deep learning and probabilistic modelling for behavior analysis	0.2	Prof. Manco		ITEE
2nd	Data driven transformation in Windtre through managers voice	0.4	Dr. Savarese, Bertone, Kudasheva	Widtre	ITEE
2nd	From Photometric Redshifts to improved weather forecasts: an interdisciplinary view on machine learning	0.2	Kai Polsterer	Heidelberg Institute for Theoretical Studies	ITEE
2nd	Cybercrime and e-evidence: the criminal justice response	0.2	Matteo Lucchetti		ITEE
2nd	AI LEGAL: Artificial Intelligence for notary's sector – a case study	0.2	Salvatore Palange		ITEE
2nd	The era of Industry 4.0: new frontiers in business model innovation	0.2	Prof. Marco Balzano	UNIVE	ITEE
2nd	Machine learning: casuality lost in translation	0.3	Prof. Valentijn	University Groningen	ITEE
2nd	Dai mainframe all'IoT, una retrospoettiva sull'evoluzione delle architetture di calcolo	0.4	Prof. Mazzeo	DIETI	ITEE
2nd	Artificial intelligence and 5G combined with holographic technology: a new perspective for remote health monitoring	0.4	Ferraro, Memmolo		
2nd	Visual Interaction and	0.4	Quartulli		ITEE

	communication in Data Science				
2nd	Big data and computational linguistics	0.4	Cutugno		ITEE
2nd	Sensoria Health	0.2	Rossetti		ITEE
2nd	Distributional Semantics Methods: how linguistic features can improve the semantic representation	0.3	Maisto		ITEE
2nd	Ethics of quantification	0.4	Prof. Saltelli		ITEE
2nd	5G: l'architettura, le applicazioni e la rete di accesso radio	0.4	Ing. Mollica		ITEE
2nd	Thriving as a doctoral student in informatics	0.3	Prof. Dr. Fitzpatrick		
2nd	Qiskit: state of the art and tools for Quantum Computers from IBM	0.3	Dr. Accetta		ITEE
3rd	Threat Hunting Use-Cases	0.4	Vladimir Kurdin	Group IB	ITEE
3rd	GDPR basics for computer scientists	0.4	Dr. Wenning		ITEE
3rd	Designing Quantum algorithms	0.4	Prof. Michele Amoretti	UNIPR	ITEE
3rd	Security challenges for collaborative autonomous aircraft systems	0.2	Cora-Lisa Perner		Lancaster University (LU)
3rd	Towards a Zero Trust Architecture in a Cloud-based Ecosystem	0.2	Dr. Michaela Iorga		LU
3rd	Industrial Perspectives of Artificial Intelligence	0.3	Prof. Nick Colosino		
3rd	Change by Game Design in Security Organisations: The Potential of Transformational Playing - Learning Experiences	0.2	Dr. Philippe Beaulieu		LU
3rd	Fighting and fearing the Other: Notes for an anthropology of nefarious systems	0.2	Prof. Ruben Anderson	Oxford University	LU
3rd	From continuous monitoring to continuous certification – the next step in cloud	0.2	Dr Jesus Luna Garcia, Robert		LU

	cybersecurity		Bosch		
3rd	SPRITE+ Top Tips Series: managing conflicting demands	0.2	Prof. Mark Elliot		LU
3rd	Back-office staff working with traumatic material in criminal justice settings	0.2	Dr. Fazeelat Duran	University of Birmingham	LU
3rd	Ciberconflitti e minacce per la pace e la stabilità internazionale	0.4	Proff. Romano, Tamburrini	DIETI	UNINA
3rd	On using simple optimization techniques for tuning of UAVs	0.4	Prof. Dariusz Horla, Dr. Fabio Ruggiero	DIETI	ITEE
3rd	Application Meaning: The Holy Grail in Distributed Systems	0.2	Dr Amit Chopra	LU	LU
3rd	Digital Twins in future public emergency response	0.2	Dr Jiejun Hu	LU	LU
3rd	Protecting our country for fun and profit	0.2	Dr Ian levy	National Cyber Security Centre	LU
3rd	Defending deep learning infrastructure against model stealing	0.2	Dr Peter Garraghan	LU	LU
3rd	Security Lancaster	0.2	Dr Oliver Fitton	LU	LU
3rd	5G networks in action – the private mobile era	0.3	Ing. Nicola Di Pietro		DIETI
3rd	QoE management in 5G networks	0.4	Prof. Luigi Atzori	UNICA	DIETI
3rd	Wireless collaborative intelligent with goal-oriented communications	0.4	Yulin Shao		DIETI
3rd	Variable IO latencies in real life	0.4	Ingg. Izzi, Minopoli, Porzio	Micron	ITEE

Research activities

Giovanni Stanco focused in research about performance assessment and security problems in IoT networking.

The first activity was an extensive bibliographic research about Internet of Things. The bibliographic research concerned the several communication possibilities currently available for IoT and the many attacks well known in literature, with special attention to the proposed countermeasures for the control of the threats by malicious attackers.

The experimental activities were conducted in collaboration with Rislab SRL, in particular the experiments for performance assessment of Low Power Wide Area Networks in IoT. Programmable bords were used for sending messages and evaluating network performance parameters. The results highlight how different networks provide different results in terms of message losses, delivery time, and duration of the battery. These important parameters must be considered when developing an IoT application.

Another important experimental activity concerned the study of task offloading techniques based on network performances. IoT sensors are typically equipped with limited resources and need the support of entities that have more computational power. Another problem that occurs in task offloading is understanding which edge node can be trusted. Different approaches have been tested for the selection of edge nodes, based on the criterion of choosing the edge nodes that have the best network performance.

Tutoring and supplementary teaching activities

Giovanni Stanco did not take part in tutoring, but he gave assistance during the exams of "Fondamenti di informatica" and "Laboratorio di tecnologie web per applicazioni industriali", taken by prof. Alessio Botta.

Credits summary

PhD Year	Courses	Seminars	Research	Tutoring / Supplementary Teaching
1st	31.2	5	28.8	0
2nd	4	6.80	49.2	0
3rd	12.4	6.20	41.4	0

Research periods in institutions abroad and/or in companies

PhD Year	Institution / Company	Hosting tutor	Period	Activities
1st - 2nd	Rislab SRL	Ing. Flavio Farttini	01/2020-10/2021	Research on IoT networking, experiments on IoT devices for performance assessment. Preparation of publications.
3rd	Lancaster University	Dr Matthew Bradbury	11/2021-04/2022	Experiments on task offloading in IoT.

PhD Thesis

In the PhD Thesis, Giovanni Stanco studies several problems regarding the network performance and security in IoT. The studied problems are performance of Low Power Wide Area Networks, the

monitoring of resources with limited resources such as IoT sensors, and the communications with trusted edge nodes according to the network conditions.

Publications

Research results appear in *2* contributions to international conferences.

List of scientific publications

International conference papers

Giovanni Stanco, Alessio Botta, Giorgio Ventre
"DewROS: a Platform for Informed Dew Robotics in ROS"
Published in: 2020 8th IEEE International Conference on Mobile Cloud Computing, Services, and Engineering (MobileCloud)
Publisher: IEEE
Conference Location: Oxford, UK
DOI: 10.1109/MobileCloud48802.2020.00010

Giovanni Stanco, Alessio Botta, Flavio Frattini, Ugo Giordano, Giorgio Ventre
"On the performance of IoT LPWAN technologies: the case of Sigfox, LoRaWAN and NB-IoT"
Published in: ICC 2022 - IEEE International Conference on Communications.
Publisher: IEEE
Conference Location: Seoul, Korea, Republic of
DOI: 10.1109/ICC45855.2022.9839078
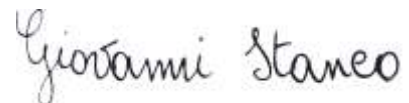
Patents and/or spin offs
None
Awards and Prizes
None

Date 20/10/2022

PhD student signature

Supervisor signature _____