Sapienza PhD in ICT

Doctoral program in Information and Communications Technologies at Sapienza Università di Roma, Rome, Italy

First Year Doctoral Program Form

LAST NAME	**Milani**
NAME	**Ileana**
CURRICULUM	**Radar and Remote Sensing**
DOCTORAL CYCLE	**XXXII**

The Doctoral Program Form contains, year by year, the description of the PhD program of each Doctoral student. This form must be submitted to the PhD coordinator with roughly the following timing:

- by the end of February of the first year for first year students
- before the admission to the second year by perspective second year students
- before the admission to the third year by perspective third year students

The Doctoral Program Proposal is approved by the PhD board shortly after submission. The Doctoral Program requirements place formalized emphasis on methodology and mastery of fundamental and applied engineering systems concepts. A Doctoral Program Proposal should be constructed in agreement with the Faculty mentor, that is the supervisor or tutor, by complying to the requirements, described in the Tables below.

ADVANCED COURSES: 12 CREDIT FORMATION UNITS (CFU)[1]
Only courses/schools providing a final verification test with pass/fail outcome certified by instructor can be included here.

Title	Type	Duration / period	CFU[2]	Motivation for selection
Radar Multifascio e Multifunzione	Master Degree Course	26 September – 21 December 2016 60 hours	6	During my Master Degree I did not attend this course, which provides important notions of modern radar systems. It is indispensable for reaching a better knowledge of the signal processing techniques used in this field. This course is also very important for me because it deals with systems and techniques that I have to use in my research project, such as DoA estimation and tracking of a moving target.
Project Management "PRINCE2 Foundation"	PhD Course	19-20-21 June 2017	6	This course will focus on the international Project Management "PRINCE2 Foundation". It will be very useful because it teaches interesting notions about the methodologies used in a project. Furthermore, it will lead to the acquisition of an international certification.
Total CFU			12	

SEMINARS AND LABORATORY ACTIVITIES: 6 CFU[3]

Activity	Type	Duration / period	CFU[4]	Motivation for selection
Scrittura tecnico-scientifica	Seminar	January-February 2017 24 hours	4	This course is very useful for a PhD Student because it gives him the basics for writing a scientific paper and make a good presentation. In fact, a good explanation of the results achieved in the research activity is a necessary point for their understanding.

[1] Please insert lines as required/appropriate, and for each line complete each column of the Table.
[2] Indicate here the CFUs that can be accounted for as a result of the successful completion of the activity; for Master Degree courses, assume 1 CFU = 8 teaching hours + 12 homework/study hours, for a total of 20 hours. This rule can be slightly adjusted for other types of courses/activities (e.g., PhD courses may require slightly less hours per CFU)
[3] Please insert lines as required/appropriate, and for each line complete each column of the Table.
[4] Indicate here the CFUs that can be accounted for as a result of the successful completion of the activity; as a rule of thumb, assume 1 CFU = 20 working hours.

Fondamenti epistemologici del sapere scientifico e tecnologico	Seminar	February-March 2017 18 hours	3	This course provides the PhD students with the guidelines for the organization of their work. It shows the scientific method, the relationship between science and technology, the problems of modelling the reality, etc.
Biologically Inspired Radars: lessons from nature	Seminar	17th February 2017	1/3	Dr Alessio Balleri has explained that radar systems play a key role in many modern defence and civilian applications. The talk has focused on bio-inspired sensing and placed some emphasis on similarities with radar micro-Doppler techniques. In fact, nature presents examples of active sensing which are unique, sophisticated and incredibly fascinating. The elements shown during the seminar are very useful for my topic.
Smartifying wireless networks	Seminar	29th September 2016	1/3	Prof. Adam Wolisz has explained the design of wireless networks with a particular attention on i) the high inefficiency of today's applications in usage of the networks, ii) context dependent predictability of the information needs of the user, and iii) location and mobility dependent expected connectivity. In particular, the third point was very interesting for my research activity.
Acquisition campaigns and Laboratory activities			2	Laboratory activities are necessary for the study of the signal behaviour and it is fundamental for a good planning of the acquisition campaigns. The measurement campaigns provide me the data that I use for my research activity. They have been carried on November 2016 and other data will be acquired in the coming months.
ICT seminars			1	I will follow further seminars that will be interesting and useful for my research activity.
Total CFU			>9	

ADDITIONAL INDEPENDENT FORMATION AND RESEARCH ACTIVITIES: 6 CFU[5]
Indicate activities that extend and complement the mandatory activities listed above

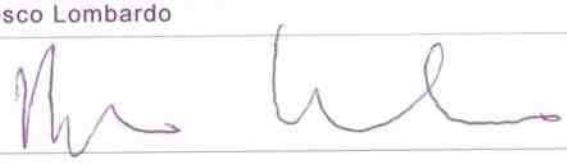
Activity	Type	Duration / period	CFU[6]	Motivation for selection
Radar Summer School The main focus of the 9th International Summer School on Radar/SAR lies in particular in imparting the knowledge of the physical fundamentals and technologies of modern Radar/SAR systems and the necessary signal processing steps. (http://www.radarsummerschool.fraunhofer.de/summerschool)	Summer school	14 - 21 July 2017 Bonn, Germany	>5	I think that the International Summer School is very interesting and important for my education on radar topics because I will have the possibility to attend lessons by the main experts in this field. I think also that it is a way to know people coming from different countries and share with them opinions and ideas. Furthermore, it is also an opportunity to improve my English.
Total CFU			>5	

RESEARCH ACTIVITY: 36 CFU

Research area	Radar and Remote Sensing: Integration of active and passive RF systems for indoor/outdoor localization

[5] Please insert lines as required/appropriate, and for each line complete each column of the Table.
[6] Indicate here the CFUs that can be accounted for as a result of the successful completion of the activity; as a rule of thumb, assume 1 CFU = 20 working hours.

Research topic	The main goal of my research topic is the definition of innovative methodologies that are able to solve the problem of indoor/outdoor localization. To reach this aim, the basic idea is to integrate systems that are usually used in different fields of application. The possibility of exploiting the complementarity among different strategies makes this integrated system attractive to solve the inherent limitations of each technique. The work will focus on: 1) The investigation of suitable positioning methodologies; 2) The improvement of each proposed localization technique, in terms of position estimation accuracy; 3) The fusion of them in an integrated system.
Framework of the proposed research topic	As explained in the description of my research topic, the final goal of my activity is to obtain an accurate localization of a target in an indoor/outdoor environment. To reach this purpose, the first step is the detailed study of the features of the employed signals (WiFi Standard, etc.) and the understanding of the potential limitations in the processing related to these characteristics. At the same time, it is also important to study the measurement equipment developed by the RRSN Group, because I will use it in the acquisition campaigns. The initial activities are planned as follows: 1) Investigation of appropriate positioning techniques (also through the study of the literature on these topics): a) Investigation and implementation of techniques for the localization of a target through the estimation of the angle of arrival (AoA) of its device transmissions; b) Investigation and implementation of passive techniques for the localization of a non-cooperative target. WiFi-based Passive Radar systems are used in this point; 2) Comparison between the results obtained in the previous two points. Particular attention will be reserved to point 1b), because passive radar systems require a deepen study. The principal aim is the demonstration of both the consistency of the results achieved with different techniques and the feasibility of their fusion. The data obtained in the acquisition campaigns will be exploited for this objective.
Research environment	The main activities of this first year will take place within the RRSN Group (Radar Remote Sensing and Navigation Group) at DIET Department.

FACULTY MENTOR (TUTOR OR SUPERVISOR)	
Prof. Dr.	Pierfrancesco Lombardo
Supervisor signature for approval	

Signature of Doctoral student

Date

02/03/2017