



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	Wojaczek
NAME	Philipp Maximilian
CURRICULUM	Radar and Remote Sensing
DOCTORAL CYCLE	XXXI

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 and Remote Sensing Laboratory	Master course	February – March	6	In this course the principles of computer simulation of typical operational scenarios for remote sensing systems are presented. Additionally, (real-time) hardware implementation is presented. This knowledge is required for efficient simulation to analyze the performance of signal processing algorithms.
Radar Multifascio e Multifunzione	Master Course	October - January	6	In this course the principles of Phased Array and Adaptive Antenna Arrays are presented. Additionally, it provides an insight on Space-Time Adaptive Processing and Side-lobe Cancellation/Blanking. Knowledge on these topics is required, to get an understanding on modern antenna systems and the topics I want to study during the PhD.
Total CFU			12	

SEMINARS AND LABORATORY ACTIVITIES: 6 CFU³

Activity	Type	Duration / period	CFU ⁴	Motivation for selection
Kolloquium of the Fraunhofer-Institut für Hochfrequenzphysik und Radartechnik (FHR)	Seminar	Monthly	5	Presentations on current research topics. It provides an insight on the state of the art in Radar and radar related topics.
NATO Lecture Series on "Cognition and Radar Sensing"	Lecture	22/10/2015 – 23/10/2015	2	This lecture series gives an insight on the current topics and applications on radar.
Doktorandenseminar	Seminar	2 hours/weekly/ November – February/April – July	3	Lectures and presentations on advanced radar related topics and on current research by PhD students at Fraunhofer FHR.
Total CFU			10	

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.

ADDITIONAL INDEPENDENT FORMATION AND RESEARCH ACTIVITIES: 6 CFU⁵


Indicate activities that extend and complement the mandatory activities listed above

Activity	Type	Duration / period	CFU ⁶	Motivation for selection
Project related work	Project related work	March/2016	6	The project participation includes practical work with real data on ISAR related topics, and the possibility to gain experience on how to format, process and work with real data in a real environment and gain knowledge on current research topics. The participation in an international project offers me the possibility to exchange ideas and scientific knowledge among researchers from other research facilities on an international basis.
Tutorial on Labview Communications / National Instruments (NI) USRP	Laboratory/Tutorial	09/02/2016	1	This tutorial provides gives an overview on how to acquire and process signals with Labview Communications using instruments and FPGAs from National Instruments. This is useful as this software and hardware provides a possibility to acquire data, to implement signal processing algorithms and to analyze their performance in a very fast way.
Total CFU			7	

RESEARCH ACTIVITY: 36 CFU

Research area	PCL Radar
Research topic	Multichannel PCL, STAP for PCL
Framework of the proposed research topic	<p>Adaption of DPCA algorithms for clutter suppression:</p> <ul style="list-style-type: none"> • Implementation on real data • Study of clutter characteristics • Study of performance of clutter suppression in the case of changing waveforms and implementation of inverse filter <p>Development of a realistic clutter simulator:</p> <ul style="list-style-type: none"> • Bistatic geometry, receiver/target motion, DVB-T transmitter • Extendable to multi-transmitter scenario • Different sub-optimal STAP techniques • Single-element antenna pattern <p>Study of real environment clutter characteristics (sea/land clutter): verification of conventional clutter model</p>
Research environment	<p>Currently I am working as a researcher at the <i>Fraunhofer-Institut für Hochfrequenzphysik und Radartechnik (FHR)/Fraunhofer Institute for High Frequency Physics and Radar Techniques</i> in Wachtberg/Germany. My employment provides me with a very good opportunity to research on Multichannel PCL, to deepen scientific knowledge and to contribute to the research community. I also get an insight on the research on other radar related and non-radar related topics, based on lectures and presentations scheduled regularly.</p> <p>Due to the amount of international projects at Fraunhofer FHR and especially at the department, where I am working, I have the possibility to work in cooperation with scientists and researchers on an international basis, which increases the scientific exchange and knowledge.</p> <p>As I am working at the FHR in Germany, I am planning to work for at least three months with the <i>Radar Remote Sensing and Navigation Group</i> at the University "La Sapienza".</p>

FACULTY MENTOR (TUTOR OR SUPERVISOR)

Prof. Dr.	Pierfrancesco Lombardo
Supervisor signature for approval	

Signature of Doctoral student



Date

18.03.16

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.