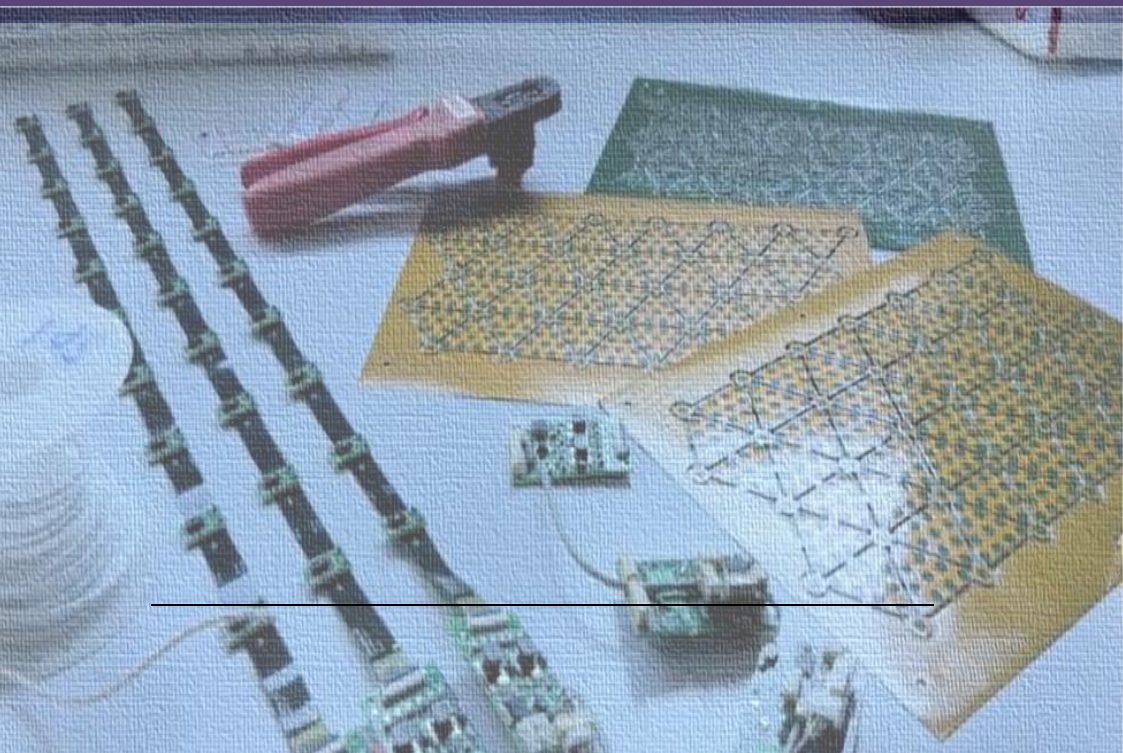
Università di Genova

DIBRIS DIPARTIMENTO
DI INFORMATICA, BIOINGEGNERIA,
ROBOTICA E INGEGNERIA DEI SISTEMI

PhD Students' Handbook

PhD Program in Bioengineering and Robotics

41st cycle



A long lasting history

UNIGE established its first PhD program in Robotics in 1991, followed by the introduction of the Bioengineering PhD program in 1999.

16 • 4 luglio 2003, Venerdì — IL SECOLO XIX

Il Dist di Ingegneria è all'avanguardia nello studio dell'apprendimento artificiale: non schiavi elettronici ma "creature" che ragionano

Genova capitale dei robot

Baby-Bot: un "bimbo intelligente" di sei mesi

Il Dipartimento informatica sistemistica e telematica raccoglie un gruppo di ricercatori italiani e stranieri che sta allevando le macchine pensanti di domani. Non aggeggi per le catene di montaggio, ma i nostri futuri "assistenti"

DONATA BONOMETTI

Davanti all'umanoide — due telecamere per occhi, sensori nelle orecchie, un braccio con mano terminale, una ventina di motori — ci sono pupazzi di peluche e macchinine. Il suo mondo, il mondo del più piccolo dei nostri bambini. E' nella fase in cui studia come afferrarli. Se, davanti a quella specie di faccia che ha, fate dondolare una musichetta, gli occhi (simulatori dei recettori della retina umana) si muoveranno ritmicamente, insieguendola. Nel silenzio della stanza cinque-sei studiosi sono concentrati sui terminali dove ritoccano l'intelligenza artificiale di questo robot, per ottimizzarla. Per ora si tratta di un neonato che ha circa sei mesi: dopo le prime settimane di inconsulti movimenti, ha imparato a controllare il Baby-Bot manipola gli

comprendere le conseguenze delle azioni. Si cercherà di imitare i processi che stanno alla base delle coscienza e dell'esperienza soggettiva tipica della mente.

Ingegneri affiancati da esperti di psicologia infantile. Dice Sandini, con la semplicità dei "cervelloni": «Non ci interessano le prestazioni, no. Ma capire quali sono i meccanismi dell'apprendimento che consentono ad un neonato di evolvere, partendo da comportamenti semplici guidati da riflessi innati, verso un sistema in grado di governare volontariamente le proprie azioni sulla base dell'esperienza e del ragionamento. Questo studio è interessante sia perché alcuni di questi passaggi non sono ancora del tutto noti, sia perché la loro comprensione potrebbe fornire utili suggerimenti per la progettazione e la realizzazione di sistemi com-

Khepera è un robot con sistema di comando neurobiologico

CHE COSE E COME FUNZIONA IL "DIST"

Il Dist, dipartimento informatica sistemistica e telematica, della facoltà di ingegneria di Genova, produce robot ma non solo. Automazione, telecomunicazioni sono altre branche

A welcome message from the coordinator

Dear students,

I am delighted to have you join our research program in Bioengineering and Robotics offered by the University of Genova.

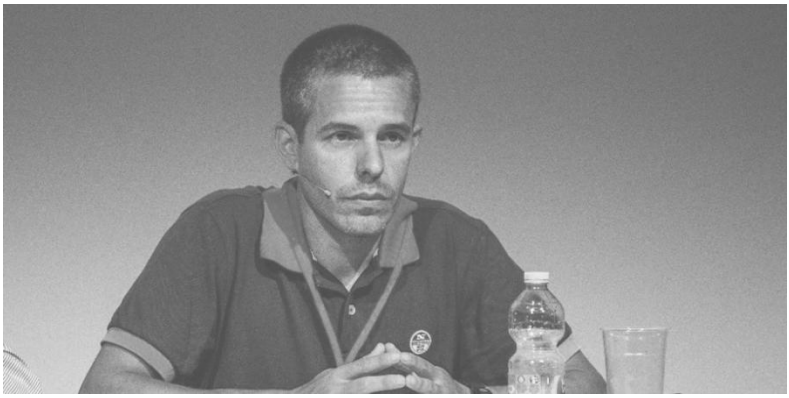
First of all, let me congratulate with you since you pass the BioRob selections. This year, for the summer PhD call, we received 129 applications for 16 open positions. At the end of the evaluation process only 12 candidates were deemed suitable for the 41st cycle of the PhD BioRob program.

In the next three years, you will be surely involved in an exciting travel made up of ambitious research projects and (hopefully) great results. This handbook is designed to guide you through the essential information, resources, and procedures that will support your PhD journey. Please take the time to read it carefully and refer to it whenever you need clarification.

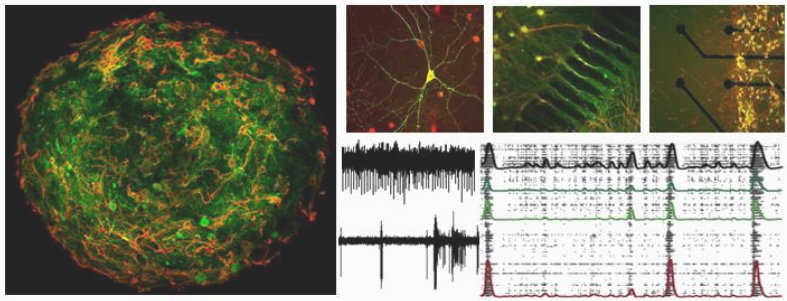
Finally, remember to contact me for any kind of information, discussion, scientific curiosity: I will be very happy to speak with all of you.

Enjoy your PhD journey!!

Paolo Massobrio



Courtesy of prof. Giorgio Cannata



Courtesy of dr. Martina Brofiga

Useful links

PhD BioRob website: https://biorob.phd.unige.it/it

PhD unige website: https://unige.it/en/students/phd-programmes

Phd BioRob mail: phd.biorob@dibris.unige.it

PhD unige (Alta Formazione) mail: dottorato@segreterie.unige.it

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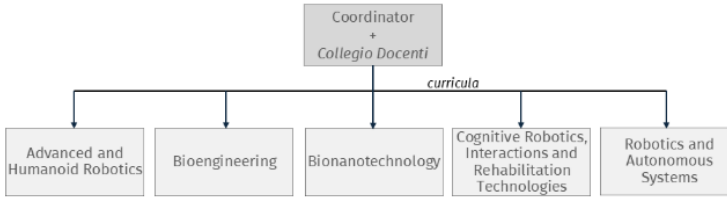
⚙ PhD Organization

BioRob PhD lasts 3 years and is organized in 5 curricula. The Collegio Docenti is the institutional board.

The PhD program in Bioengineering and Robotics is offered by the University of Genova (UNIGE).

The Doctorate in Bioengineering and Robotics is a 3 year PhD program where students get in-depth training in modern engineering methodologies and technologies and, depending on the specific curriculum, in robotics, biomedical technologies, as well as in applied life and cognitive sciences.

The 41st cycle of the Doctorate in Bioengineering and Robotics is organized into 5 curricula (Tab. 1), where in each of them a designated Reference Faculty coordinates the training and research activities in agreement and collaboration with the Coordinator of the PhD program and the *Collegio Docenti*[1].



At the beginning of the PhD, each student selects a specific research area and is expected to develop a personal research agenda, under the supervision of a tutor to acquire the analytical and/or experimental abilities required to complete the PhD research project.

[1] *Collegio Docenti* is the Italian name for the board of the PhD program. It is mainly composed by University professors with the addition of high relevant senior researchers of other research institutions (e.g., IIT, CNR) and member of companies involved in the PhD organization.

Education activities are offered through specific courses, national and international schools, seminars and/or additional activities proposed by the tutors.

During the 3 years, PhD students are required to obtain at least 180 credits (CF)[2] which are assigned as follows:

- Research activities (120 CFs, i.e. 40 CFs *per* year)
- Thesis writing (20 CFs)
- Training activities (40 CFs)

Tab.1. Curricula of the PhD program in Bioengineering and Robotics.

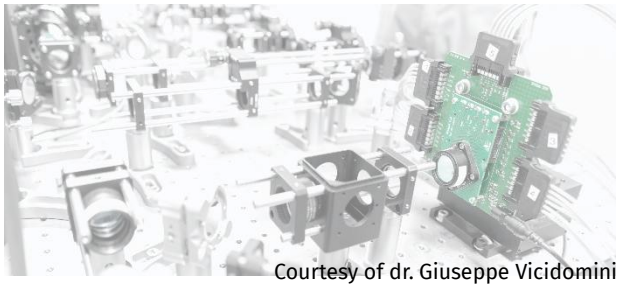
curriculum	**curriculum reference**	**contact**
Advanced and Humanoid Robotics	dr Lorenzo Natale	✉ lorenzo.natale@iit.it ☏ 010 2898232 🏠 Via S. Quirico 19 (CRIS)
Bioengineering	prof. Paolo Massobrio	✉ paolo.massobrio@unige.it ☏ 010 3352761 🏠 Via Opera Pia 13 (DIBRIS)
Bionanotechnology	dr. Giuseppe Vicidomini	✉ giuseppe.vicidomini@iit.it ☏ 010 2987607 🏠 Via E. Melen 83 (CHT)
Cognitive Robotics, Interaction and Rehabilitation Technologies	dr. Alessandra Sciutti	✉ alessandra.sciutti@iit.it ☏ 010 2987327 🏠 Via E. Melen 83 (CHT)
Robotics and Autonomous Systems	prof. Giorgio Cannata	✉ giorgio.cannata@unige.it ☏ 010 335223 🏠 Via Opera Pia 13 (DIBRIS)

[2] One CF corresponds nominally to about 25 hours of work.

Tutors

Each PhD student must have at least one active tutor/mentorship.

At the beginning of the program, the PhD Board appoints for each student one or two tutors, who is/are responsible for their scientific, technical as well as intellectual training. At least one of the tutors must be a University Professor or University Researcher. Non-academic tutors must hold a highly qualified position, at the level of Principal Investigator or above. Tutors make sure that PhD students become active members of their research group. Tutors support the publication of the scientific results of the students on international scientific journals or relevant conference proceedings, as well as their active participation in scientific conferences and schools. Tutors are responsible for making available to their students all the resources needed to carry on their research projects. The availability of sufficient resources is checked by the *Collegio Docenti* and is a necessary condition to be appointed as tutor. Within 3 months of the beginning of the PhD the list of the PhD students and correspondent tutor(s) must be formalized. During the 3-year PhD program, any change in the tutors' names (e.g., addition of new tutors, removal of tutors, etc.) must be communicated to the Coordinator.



Courtesy of dr. Giuseppe Vicidomini

🕮 Training activities

With the help of their tutors, PhD students choose courses and schools to enhance their knowledge.

PhD students must obtain 40 CFs from training activities that mainly include PhD courses, national and/or international PhD schools. It is highly recommended, that these CFs are allocated over the three years in decreasing weight, e.g. 25-30/5-10/0-5 to have more time during the 3rd year to formalize and disseminate the research results. Each year the *Commissione Didattica*[3] of the PhD program in Bioengineering and Robotics organizes *ad hoc* courses thought to be useful for the main topics of the PhD students. The list of the courses is published and updated on the web page of the BioRob PhD program.

It is worth to notice that other PhD programs of the University of Genova might offer courses in a wide range of science and engineering disciplines that can be adopted by the PhD students in agreement with their tutor(s) and evaluated by the Collegio Docenti.

For achieving the CFs, a final exam must be positively passed. The number of CFs assigned to each course is specified in the list of courses published each year on the PhD website.

In addition to the sponsored "training activities" of the BioRob PhD, students can choose the following additional typologies:

Courses that are part of one of the Graduate programs (*Laurea Magistrale*) offered at the University of Genova in agreement with the Tutor, after the *Commissione Didattica* approval and with the approval of the *Collegio Docenti*. A final exam must be positively passed and the assigned CFs are the ones

[3] *Commissione Didattica* is the Italian name for the board that organizes and schedules the teaching activities.

reported for the course on the official website. The choice of following Graduate courses is suggested if the PhD student needs some basic knowledge. For example, students with a non-engineering background, or whose research project requires the knowledge of topics that they never addressed before their previous career are recommended to take some of the courses offered by the Graduate programs in engineering, science, and/or mathematics.

PhD Schools. International PhD schools approved in advance by the *Collegio Docenti* upon a formal request to the *Commissione Didattica* by sending an email to phd.biorob@dibris.unige.it including the detailed program of the School and its duration. The evaluation of the schools is made on a monthly basis from the *Commissione Didattica*. Thus, it is warmly recommended to submit in advance the request for approval (1 month before the deadline submission). If the PhD school is not already coded in the list published in the PhD website, the *Commissione Didattica* has to assign a right number of CFs. Typically, 3CFs *per* week (5 days) are assigned. In any case, a maximum of 9 CFs for each school are granted. A certificate of attendance of the school must be presented for the CFs to be assigned.

Online Courses. The attendance and CFs assignment for on-line courses (max 10 CFs in 3 years) must be requested by the tutor to the Coordinator and to *Commissione Didattica* and approved by the *Collegio Docenti*. An official certificate of attendance and exam completion (issued by the legal entity providing the course) must be presented for the CFs to be assigned. The number of CFs will be granted by the *Commissione Didattica* and approved by the Collegio Docenti on the basis of the following criteria: i) course level (basic/advanced); ii) reputation of course provider; iii) expected workload.

⚖ Evaluation Procedures

At the end of each year, the PhD student research activity is evaluated by ad hoc commissions.

At the end of each year, PhD students must upload in the personal intranet domain[4] the following documents:

- a detailed report[5] of their research activities, including the list of publications
- a work-plan for the following year using the previous document.

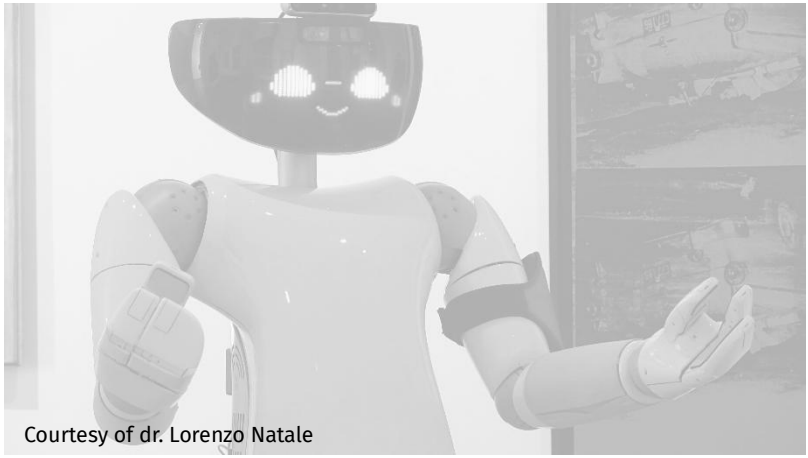
Depending on the curriculum where PhD students are performing their project, it can be required to present their results in an oral presentation to a specific commission[6] or by means a poster session presentation during the PhD Day event (end of November).

The first year report will consist of the formulation of a thesis project identifying: an assessed research work-plan, the themes addressed and their relevance for bioengineering and robotics and the first preliminary findings (if any).

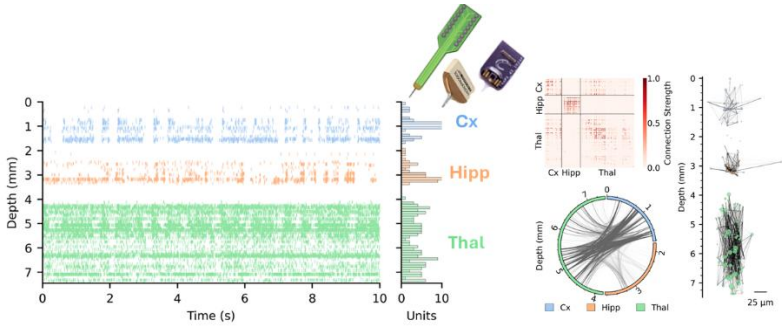
At the end of the second and third years, the students are expected to exhibit substantial progress in their thesis project. The report will focus on the state of advancement of the thesis work and on the results obtained. At the end of the third year, students are expected to write and present an almost definitive "Thesis Abstract" following the template available on the website[2].

[4] https://intranetphd.dibris.unige.it/
[5] The template is available on the PhD BioRob website.
[6] The Reference of the curriculum, will appoint an evaluation commission (at least two reviewers within the *Collegio Docenti* or qualified Faculties excluding the tutor(s)).

Each year after the presentations students will receive appropriate feedback/advice, and the commission will formulate a written evaluation. Based on this and on recommendations of the tutor(s) the Collegio Docenti will approve/not approve the admission to the following year, including recommendations to the students. It could be possible that the commission ask for further reports before definitively admitting/not admitting the student to the following year.



Courtesy of dr. Lorenzo Natale



Courtesy of prof. Michela Chiappalone

Final Examination

After the 3-year travels, it is time to write and discuss the thesis.

At the end of the 3rd year, based on the reports of the evaluation commission (at least two members) and the recommendation of the tutor(s), the *Collegio Docenti* agrees on admission or not to the final examination to get the degree of PhD.

The requirements for the admission to the final examination are summarized as follows:

- Fulfilment of the training requirements (40 CFs);
- Positive evaluation from the tutor(s);
- Positive evaluation from the evaluation commission;
- Approval of the Collegio Docenti of the 3rd year;
- Being author or co-author (first name) of at least one scientific paper in a peer-reviewed international journal (published or accepted for publication) or in a well-recognized international conference with peer review of full papers (at least 4-pages)

The Ph.D. candidates admitted to the final examination must submit a written dissertation (in English) using the template available on the website. In agreement with the University rules for doctoral programs[7], the PhD Board will appoint, for each candidate, at least two external reviewers with relevant expertise at international level in the field of the PhD dissertation. The reviewers will assess the quality and the scientific relevance of the thesis work and within 30 days will provide a written

[7] See art. 25 of the "*Regolamento di Ateneo per il Dottorato di Ricerca*" issued by Rector's Decree No. 2340 of May 27th, 2022. (https://unige.it/sites/unige.it/files/documents/Regolamento_dottorato_ricerca_2022.pdf)

evaluation report. The evaluation may propose to either admit candidates to the final exam or (in case of major requests for modifications) to postpone the exam for up to 6 months, during which candidates will be required to revise their work. The reviewers will provide an updated written evaluation that accounts for the revisions. After 6 months the thesis is admitted in any case to public defense.

The final exam consists of a public thesis defense, in front of a commission composed of three university professors[8]. The commission can include professors of foreign institutions[9] and at least one professor member of the *Collegio Docenti*. It is optional include in the commission up to two external experts without any academic role (e.g., senior PIs of research institutions) in a field related to the specific curriculum. The *Collegio Docenti* may appoint different commissions for each candidate or group of candidates with similar research themes.

[8] One month should be allowed for the official appointment of the committee, which takes place through a Rector's decree.

[9] At least two professors of foreign institutions are mandatory if the PhD candidate has applied for the label of international PhD.

Technical Duties

Doctoral booklet, IRIS catalogue, questionnaires …

PhD students must absolve some technical duties that are needed to evaluate their progression and certificate the relevance of the scientific achievements as well as to provide a feedback to the Coordinator and to *Collegio Docenti* in order to provide feedback to make the PhD program better and increasingly efficient year after year.

- Upload to the IRIS platform[10] all your research products. Examples include: congress abstracts, conference proceedings, journal papers, patents, software, book chapters, … Items uploaded to IRIS are automatically transferred to your doctoral booklet.
- Doctoral Booklet[11]. Write in the booklet information regarding: i) the participation to scientific congresses, workshops, and meetings; ii) participation to PhD schools; iii) seminars; iv) courses.
- Complete the questionnaires or other documents to assess the quality of the doctorate and providing hints for its improvement. Typically, questionnaires are sent in September and have to be filled necessary (but not sufficient) condition to be admitted to the following PhD year or to the final exam.

[10] https://unige.iris.cineca.it/
[11] https://servizionline.unige.it/web-studenti2/en/#/v2/libretto/5001

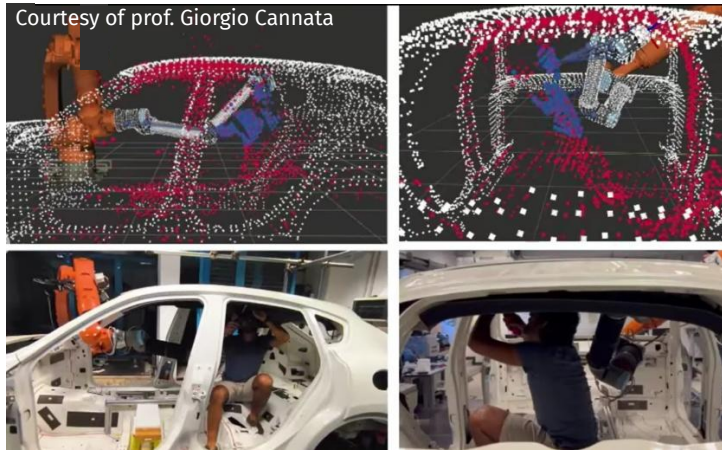
💰 Research Allowance

PhD students have an own "small" fund

PhD students of Bioengineering and Robotics have a personal fund corresponding to the 10% of their annual fellowship. For example, if the fellowship is 17'550 €/year, the research fund of the PhD student is of 1'750 €/year. Such a funding can be used for:

- mobility (attendance at conferences, workshops, PhD Schools, short visits at other universities or laboratories)
- different types of purchase (e.g., laptops within the first 18 months of the course; consumables limited to the needs of the student and their research, adequately motivated by the student in agreement with the tutor;
- books and magazine;
- publication on open-access journals

Any unused funding can also be carried over to subsequent years (added to the allocated amount of the year), but it must strictly be used before the end of the scholarship. Any remaining funds will be reclaimed by the scholarship provider.



Abroad Stage

PhD BioRob strongly encourages students to spend a period at abroad research institutions

The *Collegio Docenti* strongly encourages PhD students to carry out periods of research activity in foreign institutions as an integral part of their PhD training[12]. During the period carried out abroad, the scholarship is increased of 50% with respect to its nominal value.

The authorization to spend periods of research activity in foreign institutions must be requested to the Coordinator and approved by the *Collegio Docenti*. The procedure is as follows:

- The hosting institute must write a formal invitation letter for the student, clearly indicating:
    - the period of the visit (starting and ending dates)
    - the name of the supervisor at the host institution
    - the scope of the research
- The tutor must write a letter that authorizes the PhD student to visit the hosting institute indicating the same information listed above. The tutor can also request the increment up to the 50% of the scholarship for the visiting period. The letters must be sent to the coordinator in advance at the following email address: phd.biorob@dibris.unige.it.

[12] Some PhD scholarships require a mandatory abroad period. It is the responsibility of the PhD student and their tutor to ensure the type of scholarship and to schedule this period in advance.

🗣 Tutoring activities

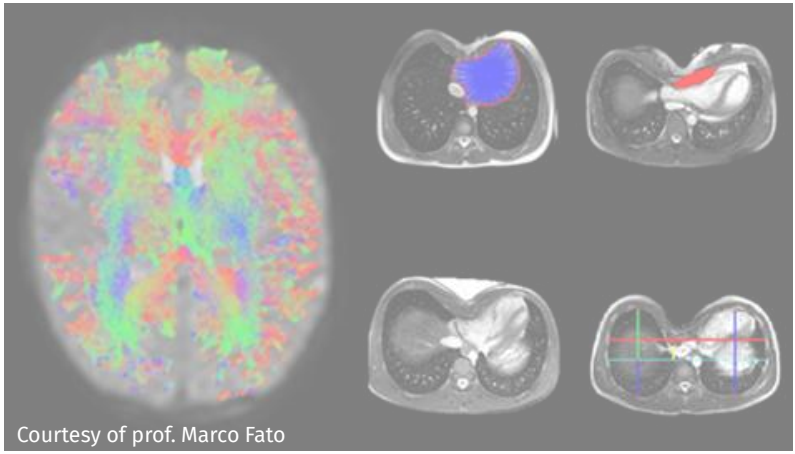
PhD BioRob students can carry out teaching activities

PhD students, as an integral part of the training project, may carry out two types of teaching activities:

- activities of tutoring[13] for bachelor/master students for a maximum of 60 hours/academic year for no more than three years
- activities of teaching assistance[14] for a maximum 40 hours/academic year

Activities must be previously authorized by the *Collegio Docenti* and they will not entail any increase in the scholarship.

PhD students can also support their tutor(s) in the supervision of bachelor and Master students in the role of *correlatore*.



Courtesy of prof. Marco Fato

[13] See "*Regolamento per lo svolgimento di attività di supporto alla didattica nei corsi di studio*" https://unige.it/sites/unige.it/files/documents/Regolamento_supporto_didattica.pdf

[14] See, Art. 11. comma 2 Legge 240/2010. https://unige.it/sites/unige.it/files/2023-11/Regolamento_incarichi_di_insegnamento.pdf.

Administrative Contacts

The PhD secretariat is coordinated by Valentina Scanarotti and Emanuele Cannata whose office is located in Viale Causa. The official email is: phd.biorob@dibris.unige.it.

Tab.2. Administrative contacts of the PhD in Bioengineering and Robotics

curriculum	administrative contacts	contact
Advanced and Humanoid Robotics	Silvia Ivaldi	✉ silvia.ivaldi@iit.it ☏ 010 2898265 🏠 Via S. Quirico 19 (CRIS)
	Floriana Sardi	✉ floriana.sardi@iit.it ☏ 010 2898259 🏠 Via S. Quirico 19 (CRIS)
Bioengineering	Valentina Scanarotti	✉ phd.biorob@unige.it ☏ 010 33566821 🏠 Viale Causa 13 (DIBRIS)
	Emanuele Cannata	✉ phd.biorob@unige.it ☏ 3408406248 🏠 Viale Causa 13 (DIBRIS)
Bionanotechnology	Manuela Salvatori	✉ manuela.salvatori@iit.it ☏ 010 2897609 🏠 Via E. Melen 83 (CHT)
	Silvia Tumino	✉ silvia.tumino@iit.it ☏ 010 2896876 🏠 Via Morego 30 (CCT)
Cognitive Robotics, Interaction and Rehabilitation Technologies	Sara Guastavino	✉ sara.guastavino@iit.it ☏ - 🏠 Via E. Melen 83 (CHT)
Robotics and Autonomous Systems	Valentina Scanarotti	✉ phd.biorob@unige.it ☏ 010 33566821 🏠 Viale Causa 13 (DIBRIS)
	Emanuele Cannata	✉ phd.biorob@unige.it ☏ 3408406248 🏠 Viale Causa 13 (DIBRIS)

Mission rules

Pay attention to move in advance, when you organize a mission out of Genova!

Every time a PhD student needs to go out from their institution, they have to be authorized. Thus, in order to be sure that all the bureaucratic staffs are finalized on time, it is necessary at least two weeks before the travel to log in to the U-Web website[15] using the UNIGE credentials. A new mission has to be added and created and the fields of the form should be filled. The Department Administration will activate the procedures to authorize your travel/mission. It is worth mentioning that the authorization to use your 10% budget for a mission is given through U-Web website, and thus it is not necessary to request it via email[16]. We warmly recommend PhD students to read carefully the University rules for travel and reimbursements[17]. Finally, it is possible to ask an advance payment for the mission (75% of all the foreseen expenses) when the quote is equal or higher than 250,00 €.

The PhD student is required to pay all expenses in advance and collect original receipts for items such as train/flight tickets, meals, public transportation, and certificates of attendance. Upon returning, the mission has to be closed using U-Web website attaching the scan of all the receipts. However, the original receipts have to be provided to the Department Administration[18]. If the travel is reimbursed by another

[15] https://unige.u-web.cineca.it/appautmis

[16] This doesn't apply only to conferences held in Genova, online courses, online seminars and conferences, or when a PhD student interrupt the 50% increase of the scholarship to attend to a mission. In these cases, it is requested an authorization to the Coordinator *via* email.

[17] https://unige.it/albo/download/2840.pdf.

[18] At DIBRIS, the reference administrative contact for missions is Roberta Usari (roberta.usari@unige.it), who is available from Monday to Wednesday (9:00-12:00). For scheduling a different time appointment, write an email.

institution, as UNIGE PhD students, the authorization is always mandatory from UNIGE using the same procedure as mentioned above. Upon the return (end of the mission), the procedure has to be closed by selecting the option “mission done without expenses”.

A mission starts from the official work location and not the place of residence[19]. The admitted means of transport are:

- Train, plane, suburban bus (e.g., FlixBus), and all public urban transportations.
- Taxi: only for transfers from and to airports-/train stations/hotel/conference or meeting venue.

More information and rules about the missions can be found in the Annex 1, published on the BioRob webpage.

[19] Unless it is proved cost savings.

⚕ Health coverage

According to the Italian law[20], foreign citizens are supposed to have a health coverage.

For EU citizens that already have European Health Insurance Card (EHIC) issued in the country of residence[21], it is not necessary to register with the SSN[22] in order to get health insurance. If they need to undertake medical examinations, they can address any general practitioner free of charge. The General practitioner can prescribe medicines or specific examinations. Specific examinations must be booked through a phone call to CUP[23] whose phone number is 010-5383400. The service is available from 8.00 to 18.00 from Monday to Friday.

For extra-EU citizens or for EU citizens who do not hold EHIC, in order to get health insurance, they have to register with the SSN. The annual contribution amounts is 700€[24] that has to be paid by "F24 form"[25] adding the following codes where required: *Codice Regione*: 09; *Codice Tributo*: 8846. It is worth mentioning that the payment is valid for one solar year. This means that if the PhD fellowship starts on 1st November, PhD student has to apply for a 3-month only registration, corresponding to about 35 € postal payment. This Insurance guarantees total cover and entitles the PhD student to choose the own general practitioner. Alternatively, students can subscribe a private health insurance policy guaranteeing the same coverage of the public one.

[20] D.Lgs. 286/1998 art. 34.
[21] https://ec.europa.eu/social/main.jsp?catId=559&langId=en&intPageId=980.
[22] SSN is the acronym for "Servizio Sanitario Nazionale", i.e., National Health Service.
[23] CUP is the acronym for "Centro Unico di Prenotazioni", *i.e.*, Central Reservations Office.
[24] https://www.salute.gov.it/new.
[25] https://www.agenziaentrate.gov.it/portale/schede/pagamenti/f24/modello-e-istruzioni-f24

Residence Permit

Important rules for extra EU citizens!

The residence permit is issued to foreign citizens coming from Extra EU countries. It is granted a visa for study purposes from the Italian Embassy or Consulate in their country of origin or residence. Entering to Italy with a visa for study purposes, it is mandatory submitting a request of residence permit to the *Questura*[26] through the kit available in any Post Office. The first residence permit for study purposes issued to PhD students has a limited duration, usually corresponding to the entry visa expiration. Then the necessary steps are: i) submit the first request of residence permit within the first 8 days from the arrival in Italy; ii) the receipt of the request of issue entitles to enjoy all the rights related to the possession of a residence permit and certifies that you correctly submitted your application but, unlike the residence permit, it does not allow to travel to another Schengen area country.

The owner of a residence permit for study purposes is allowed to:

- travel to other Schengen area countries for a period shorter than 3 months without fulfilling any formal obligation;
- submit application for family reunion;
- be registered with the National Health Service;
- have a part time job like Italian citizens, provided that they do not work more than 20 hours per week;
- enjoy all the welfare benefits deriving from a regular contract of employment.

It is recommended to refer to the UNIGE website for more detailed information[27].

[26] Questura di Genova is located in Via Diaz 2.
[27] https://unige.it/en/internazionale/permesso

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