Public competition for the admission to PhD programs of Bocconi University

THE RECTOR

in compliance with the law and the rules and regulations of the University[1]

DECREES as follows:

Article 1: PhD PROGRAM

Bocconi University hereby announces the Public Call for Applications to the 42nd cycle – 2nd part (Academic Year 2026/2027) of the PhD Program in **Statistics and Computer Science (STAT-CS), curriculum in Computer Science.**
This second call is issued within the framework of the FIS3[2] – Fondo Italiano per la Scienza[3] – funding scheme. The doctoral positions advertised under this call are financed under the aforementioned program and are linked to the following research projects:

1. **Beyond Fine-Grained Complexity (BEFINE)[4], Principal Investigator: prof. Adam Teodor Polak;**

2. **Political Beliefs and European Political Integration (POLEUROPE)[5], Principal Investigator: prof. Guido Enrico Tabellini;**

3. **Decoding the Language of Single-Cell Gene Regulation with Transformers (DECODE)[6], Principal Investigator: Andrea Tangherloni.**

Successful applicants will be admitted to the PhD Program in Statistics and Computer Science (STAT-CS), curriculum in Computer Science (42nd cycle – 2nd part, Academic Year

---

[1] - Ministerial Decree 14th December, 2021, n. 226 and Ministerial Guidelines 22nd March, 2022 regarding accreditation of Programs and Universities.
- Law 30th December 2010 n. 240 art. 19.
- Bocconi PhD Programs - Academic Rules and Regulations (issued with R.D. 76/2025) and PhD Programs Handbook,both published on Bocconi website).
- Deliberations of the PhD School Council, Academic Council and University Board- Executive Committee regarding this additional Call to be launched in 2026-27.

[2] Issued with Director-General's Decree n. 1802 of 21-11-2024

[3] The Italian Science Fund (Fondo Italiano per la Scienza - FIS) is an Italian public funding program aimed at supporting high-level fundamental research, inspired by the model of the European Research Council (ERC), across three schemes: Starting, Consolidator, and Advanced Grants. Website: https://fis-submission.mur.gov.it/.

[4] Director-General's Decree No. 18010 of 12 November 2025 – Final Ranking Lists and Admission to Funding – PE Macro-area

[5] Director's Decree No. 18169 of 17 November 2025 – Final Ranking Lists and Admission to Funding – SH Macro-area.

[6] Director-General's Decree No. 18010 of 12 November 2025 – Final Ranking Lists and Admission to Funding – PE Macro-area

2026/2027) and will conduct their doctoral research activities within one of the above-mentioned projects.

A detailed description of the PhD Program and of each project is provided in the Annex to this Call, which forms an integral part thereof.

The activation of the PhD programs is subject to the completion of the Ministerial accreditation process.

Article 2: PLACES AND FINANCIAL CONDITIONS

The enrollment of the qualified candidates (pursuant to art. 9 and 10) shall take place exclusively under the following condition:

- **with FIS fellowship**[7]

A total of **3 FIS fellowships** is available under this Call, with **1 position** allocated **to each of the research projects** referred to in Article 1 and described in Annex 1.

PhD students are always required to pay the regional tax, in accordance with current regulations (amount of regional tax: see art. 11).

Article 3: REQUIREMENTS

Applications can be submitted by candidates of any citizenship who:
- have completed or are completing their graduate studies and
- have at least a "proven" B2 (CEFR) level of competence in English.

Graduate qualifications accepted:
- Italian degrees: second level degrees ("laurea magistrale/specialistica, laurea magistrale a ciclo unico, laurea vecchio Ordinamento");
- non-Italian degrees of equivalent level (e.g. level 7 European Qualification Framework) recognised by the Admission Board.

The suitability of foreign qualifications is verified by the Admission Board in conformity with the applicable Italian and foreign rules, or in conformity with international treaties or agreements on the validity of qualifications for post-graduate education.
Candidates whose Italian or non-Italian degree qualifications have not yet been awarded by the final application deadline can take part in the selection process and will be admitted conditionally.
They must be awarded the required degree qualifications by 31st October 2026, or their enrollment will be void. Certifications of required qualifications must be produced by 10th December 2026.

Article 4: SELECTION DEADLINES

Application opening date	17th April 2026 at 6:00pm CET
Application closing date	18th May 2026
PhD admission results (personal email about admission result)	No later than 8th June 2026

[7] Bocconi provides residual co-funding to ensure complete coverage of all costs.

Article 5: APPLICATION

Applications - in English - shall be submitted online at *http://www.unibocconi.eu/admissionphd*.

To complete their application, applicants must:
- register to obtain a Personal ID and password;

(*please note that Bocconi students already have the required credentials*);
- enter the required information in the fields provided;
- upload the necessary documents;
- submit the application.

Detailed instructions can be found at
https://www.unibocconi.it/en/programs/phd/admission-phd-programs/preparing-apply

Applicants are responsible for the accuracy of the information they provide and the validity of the documents they upload. The University reserves the right to verify such information and documentation and to exclude the students at any time, even after the completion of the enrollment procedure.

Entering data and uploading documents:
Applicants can access the online procedure more than once.
- Entering data:

Applicants will enter data on each section, then click on SAVE for each section; data can be modified and then saved by clicking on SAVE.
- Uploading documents:

Applicants will upload documents on each separate section; if changes are required, an uploaded document can be replaced with a new document, which will be saved automatically, or cancelled if applicants want no document to be uploaded.
If more than one document needs to be uploaded, a zip file is to be created and then uploaded.

Submitting application:
First step:
Applicants must click on SUBMIT DATA only when no changes are needed in the DATA entered on each section. No data changes are allowed after clicking on SUBMIT DATA.
Second step:
Applicants must click on SUBMIT APPLICATION only when no changes are needed in each UPLOADS section. No data and/or uploads can be changed after clicking on SUBMIT APPLICATION.
In summary, applicants must click on SUBMIT DATA and SUBMIT APPLICATION **only** when they have finalized their application.
Applications are completed and can only be assessed after clicking on SUBMIT DATA and SUBMIT APPLICATION.

In order to close the application and be evaluated, all the mandatory documents must be uploaded.

Article 6: SELECTION CRITERIA

Admission to the PhD program is decided by the Admission Board, who will evaluate the suitability of the applicants for the program.
The selection process takes place under the following method:

One step evaluation: Assessment is based on the candidate's dossier only.
The Admission Board may decide to conduct a brief online interview to get clarification about the students' qualifications. No "separate" points are given to the possible interview.

The assessment is based on a candidate:

- Curriculum Vitae (mandatory);
- Academic Records (mandatory);
- International Graduate Admission Tests Scores (GMAT or GRE, not mandatory);
- Statement of purpose (mandatory);
- Up to two reference letters (not mandatory).

The **assessment criteria** are as follows:

- a maximum of **50 points** for the applicant's curriculum vitae and academic records;
- a maximum of **10 points** for GMAT/GRE score;
- a maximum of **40 points** for statement of purpose and reference letters.

A minimum of 60 points is required to be eligible for admission.

Article 7: REQUIRED DOCUMENTATION FOR APPLICATION

All documents must be in English, except for those regarding the academic records (which can be in Italian) and publications, which can be in any language.

The table below provides a general overview of the documents that are required during application. For each document, the characteristics that the uploaded file must have are described.

TYPE OF INFORMATION	REQUIRED online INFORMATION	DOCUMENTS TO BE UPLOADED
Personal CV	Personal details	- copy of international passport (preferred) - identity document-duly translated in English if not written in Italian (second choice); - passport photo (JPG format); - full CV (education, work experience, language skills, study/work abroad, other relevant skills and experiences.
English language requirements	Proof of competence: - Recognized international English language certification /test; in case	Documentary evidence: - in case of international language certification / test: foreign

A B2 (CEFR) competence level of English or above <u>is required</u> to be admitted to all PhD programs	of international test (TOEFL, IELTS) the result must be still valid (not expired); - University or secondary school studies in English; - internal English exam in a Bocconi degree program; - English native speaker.	language certificate; the list of recognizable certifications /tests is available in the online application procedure - in case of secondary school studies in English: high school certificate; - in case of University studies or internal English exam in a Bocconi degree program: no upload is required (info is available in the section "academic records"); - in case of English native speaker: no upload is required.
Academic records Only applicants with Italian graduate degrees or non-Italian degrees of equivalent level (7 EQF), recognised by the PhD Admission Board, can be admitted to the PhD programs. Applicants who have not achieved their degree yet are allowed to apply, but they must obtain the degree by 31st October 2026, otherwise their enrollment will be void.	University, name of degree, field of study, type of degree (one-cycle system, two-cycle system)	Documents in English or Italian ● Two-cycles system, (3+2 yrs, 3+1 yrs, 4+1 yrs, 4+2 yrs, others): <u>Undergraduate degrees (6 EQF)</u>: Transcript of exams <u>and</u> certification of degree awarded and final grade. (**see "*" note below the table**) <u>Graduate degrees (7 EQF)</u>: Transcript of exams. If the applicant has already been awarded a degree, the certification of the degree awarded with final grade is also required: **see "*"**) ● One-cycle system (4yrs, 5 yrs, others; 7 EQF): Transcript of exams. If the applicant has already been awarded a degree, the certification of the degree awarded with final grade is also required: **see "*"**)
International graduate admission tests score (GMAT/GRE) - *This document is NOT mandatory but contributes to increasing the score in the final ranking.*	GMAT (or GRE) with date and results. A valid (not expired) result is necessary. Please note that GRE Test Taker Score Reports are only available 15 days after the test date. We urge applicants to take the test well in advance as the report must be uploaded before the application closing date, 16th May 2026)	GMAT: official score report or unofficial report GRE: Test Taker Score Report

Statement of purpose	---	Short description (**max 1200 words**) of motivation for enrollment in Bocconi PhD programs, research interests and professional goals
References (up to two reference letters) - *These documents are NOT mandatory but contributes to increasing the score in the final ranking.*	Names and email addresses of referees (up to two) chosen by the applicant. **Applicants are advised to enter and save referees' names and e-mail addresses well before the deadline, so the referees will have time to write and upload their letters**	Referees will be automatically asked to upload their reference letters by the application closing date, 16th May 2026 Applicants can access the online procedure to see whether the reference letters have been uploaded

(Notes):
(*)Candidates must upload certification of their degrees specifying: the name of the degree, home University, date of graduation, final grade (if available), exams taken and grades achieved.
Candidates who do not have completed their graduate studies must upload documents certifying their enrollment in a degree program, their full study plan, exams taken and grades achieved.
Self-certification is allowed only for Italian and foreign candidates holding Italian degrees.
Documents sent by post or email are not accepted.

Article 8: RESULTS

The Rector validates the competition records and approves the ranking lists.
Candidates who have ranked highly on each list are declared admitted, provided they meet the admission requirements for access to the PhD program.

Candidates are admitted to the PhD program in the ranking list order until all available positions under the present Call are filled. Candidates on the waiting list may be offered a place if and when higher-ranked candidates decline the offer, provided that places are still available.

By 8th June 2026 each candidate will receive a personal email at the address provided during the online application, informing them about the outcome of their application.
Using their ID and password, candidates will be able to access the online procedure, for further information, including:

- if their status is "with fellowship": points awarded, ranking and financial conditions;
- if their status is "in the waiting list": points awarded and ranking;
- if their status is "not admitted": points awarded.

The ranking of the Call for Application is published in compliance with data privacy laws on *http://www.unibocconi.eu/admissionphd* (privacy is guaranteed).

Article 9: ENROLLMENT DEADLINES

top ranking candidates "with confirmed fellowship"	by 22nd June 2026
replacement candidates "with fellowship"	Within 7 days from notification and, in any case no later than July 3rd

Please note that:

§ Top ranking candidates admitted with fellowship receive just one notification (admission result + deadline for enrollment).
They must enroll by 22nd June 2026.
If they do not enroll by that date, they will automatically be considered to have declined the offer.
Candidates admitted with fellowship who intend to decline the offer should decline it well before 22nd June 2026 to allow replacement applicants to receive their offer as soon as possible.

If students enrolled with fellowship withdraw after the end of enrollments (3rd July 2026), a further round of replacements will take place and, in any case, no later than 1st September 2026.
Replacement of candidates is not allowed after the beginning of the first year of the program (1st September 2026).

Article 10: ENROLLMENT PROCEDURES

Enrollment takes place online (in the ENROLLMENT Section), using the ID and password provided at registration.

The following documents must be uploaded:

1)the enrollment form, duly completed and signed (the form can be downloaded from the online procedure);
2) research budget form to choose between the purchase of the laptop and the use of funds for research-related travel (e.g. conferences) during the first year, upon authorization of the PhD Program Director.

Certification attesting awarding of the graduate degree [8] is required in order to finalize enrollment.
Certifications can be:
- uploaded when enrolling via online procedure
- delivered to PhD School Office (by 10th December 2026).

In particular:
+ Italian degrees: certification issued by the awarding Italian University or self-certification;
+ non-Italian degrees:
  - EU countries and UK: certification in English issued by the awarding University;

[8] Name of degree program, level, University, graduation date, final grade (if any).

- non-EU countries: 1) certification in English issued by the awarding University; 2) diploma supplement or CIMEA certificate of comparability or other certification of value issued by ENIC_NARIC centers or "dichiarazione di valore "[9] issued by the Italian Embassy or Consulate of the country where the degree was awarded.

Article 11: FINANCIAL MATTERS

The PhD positions offered under the present Call are funded through FIS fellowships[10].

The fellowship amounts to € 27,000 for the first year and € 23,000 for the subsequent years (2nd, 3rd, 4th).
The Fellowship is renewed in the following years, subject to the fulfilment of the requirements for admission to the following year.

The fellowship is exempt from personal income tax. It is, however, subject to INPS contributions (INPS – National Social Security Institute). The relevant contributions are shared between the University (currently 23.35%) and the doctoral candidate (currently 11.68%). The fellowship amount is gross; the portion of contributions borne by the doctoral candidate is deducted directly from each monthly instalment and transferred to INPS.

For study and research activities abroad (at least one-month, full months only) authorized by the PhD Program Director, the fellowship **is increased by 50%** of € 16,243 (ministerial amount) in proportion to the duration of the stay abroad and for a maximum total period of 12 months (except for exceptional cases provided for by law).

In compliance with Italian law, all PhD students (with and without fellowship) are provided with an annual **budget (1,650 € per year) for "study and research activities"** (the use of the budget is always subject to the Program director approval). In the first year only, PhD students may choose to receive a Bocconi laptop instead of using the research-related budget.

PhD students are also covered by **Health Insurance Policy** provided by Bocconi which includes accidents occurring in work-related activities at Bocconi and while travelling (the travel must be previously authorized by the Program Director).

Bocconi PhD Programs Handbook (*https://www.unibocconi.eu/phds*) gives detailed information on fellowships and financial aid.

All PhD students (with fellowship, with tuition waiver and paying students) are required to pay the current **annual regional tax of € 190**, whose amount may be modified by law at a later date.

Article 12: ADMISSION BOARD

Applicants' suitability for the PhD program is evaluated by the Admission Board, which is appointed by the Rector after consulting the Faculty Board and is composed of at least three members of the Faculty Board itself.

[9] Document certifying the "level" of university studies (first level – undergraduate – level 6 EQF; second level-graduate – level 7 EQF; third level – post-graduate – level 8 EQF).
[10] Bocconi provides residual co-funding to ensure complete coverage of all costs.

The composition of Admission Board will be published after the Call's deadline at *https://www.unibocconi.it/en/programs/phd/admissions*

Article 13: DUTIES AND ACTIVITIES

Bocconi PhD programs require full-time commitment and attendance is compulsory.
The selected PhD students will have to fulfil the requirements of the PhD program's study plan that are published on the Admission webpage (Select a program > Planned study program).
The selected PhD students will conduct research on the project for which they have been specifically recruited.

Moreover:
- during the first year of the PhD program, simultaneous enrollment in another program is not allowed as this would hinder active and regular participation in PhD academic activities;
- in the following years, enrollment in another study program (while still doing the PhD at Bocconi), is allowed only after notification to the Program Director and authorization of the PhD Faculty Board (if deemed not compatible, the student will be asked to choose for one of the two programs).

Students can be authorized by the Program Director to temporarily study and do research in Italy and abroad in private and public bodies and institutions.

Article 14: FURTHER INFORMATION ON PhD PROGRAM

More detailed information about:
- PhD program attendance and evaluation;
- thesis writing and submission;
- final examination

can be found in the Bocconi PhD Programs Handbook at *https://www.unibocconi.eu/phds*.

Article 15: PRIVACY

The data will be processed under General Data Protection Regulation n. 679/2016.
Privacy Policy can be found online at *http://www.unibocconi.eu/privacy* (please read "Students, participants, Alumni and Donor Privacy Policy").

Article 16: RESPONSIBILITY FOR THE PROCEDURE

Pilar Emma, Head of Academic Planning and Monitoring, (e-mail: *phdadmission@unibocconi.it*) is responsible for the procedure of the Call.
Copy of the Call is available at *http://www.unibocconi.eu/admissionphd* .

The Rector
Prof. Francesco C. Billari

Rettore
FRANCESCO
CANDELORO BILLARI
16.04.2026 16:23:09
GMT+02:00

Annex 1

PhD program in Statistics and Computer Science – curriculum in Computer Science

Curriculum	Computer Science
Duration	4-year, full-time program
Language	English
Start date	1st September 2026
OVERVIEW Research interests and Faculty	The PhD program in Statistics and Computer Science at Bocconi University is a 4-year program taught in English that provides students a strong statistical, computational and mathematical background. The program features two curricula: Statistics (STAT) and Computer Science (CS). Specifically, the curriculum in Computer Science comprises, during the first year, both shared and curriculum-specific courses that are compulsory for all enrolled PhD students. These provide a wide range of theoretical, methodological and computational skills that are essential for research in the Computer Science curriculum. The second year features reading groups and courses taught by international Visiting Professors. Students receive dedicated mentorship throughout their time at Bocconi. The faculty includes internationally recognized leading researchers in Statistics, Computer Science, Machine Learning, Probability, and Statistical Physics. The program also benefits from contributions of distinguished visiting professors who deliver short monographic courses. The PhD in Statistics and Computer Science is designed for highly motivated students aiming to pursue first-rate research careers in academia, research institutes and industry. Career opportunities also extend to central banks, financial institutions, government agencies, international organizations, and public health institutions. For more information about the program, please visit the website: *https://www.unibocconi.it/en/programs/phd/phd-statistics-and-computer-science*

BEFINE Beyond Fine-Grained Complexity CUP J53C25002160001 - FIS-2024-04061	
Scientific Area	Computer Science (INFO-01/A)
Principal Investigator	Prof. Adam Teodor POLAK
Places available with fellowship	1
Start date	1st September 2026
Project overview	This is a project in fine-grained complexity and algorithms. In particular, it aims to draw connections between diverse fine-grained complexity hypotheses, and to extend the theory with beyond-worse-case analysis.
Research objectives	The PhD candidate will work on developing fine-grained reductions between various fundamental computational problems. Such work may also lead to improved algorithms or conditional irreducibility results.
Profile of the candidate	Candidates should have: - strong background in algorithms and data structures, discrete mathematics, linear algebra, and probability; - strong interest in algorithms research. Further desirable qualifications are: - relevant research experience; - experience in IMO, IOI, ICPC, etc.

POLEUROPE Political Beliefs and European Political Integration CUP J53C25002480001 - FIS-2024-05869	
Scientific Area	Political economy (ECON-01/A)
Principal Investigator	Prof. Guido Enrico TABELLINI
Places available with fellowship	1
Start date	1st September 2026
Project overview	The project plans to study the formation of political beliefs, with a particular focus on attitudes towards European political integration and social identity theory. We plan to investigate through online experiments how to reinforce European vs national identities, and how this affects views towards European integration. We also plan to uncover and compare the narratives and mental models that shape support for and opposition to European political integration. We plan to collect data from surveys, media, political speeches and school textbooks, to understand how narratives and mental models change over time and differ across countries, and how they can be changed through persuasion.
Research objectives	The goal is to identify persuasive narratives and those easier to debunk, providing insights on how to achieve a more effective European political union. Overall, this research will offer new insights on how political beliefs are formed, how propaganda influences them, and on what shapes attitudes towards European political integration. The project will produce several kinds of outputs: 1. scientific papers, to be submitted for publication in top general interest journals in economics. 2. Data sets on narratives and mental models. 3. Workshops and conference. We will organize some workshops during the entire duration of the project, on the broad topic of the planned research, and a conference to be held towards the end of the project. Besides the scientific impact of the publications, the results of the project will inform policy and political decisions on issues of European political integration
Profile of the candidate	The PhD candidate will contribute to the project, by assisting us in measuring the narratives and mental models shaping public attitudes toward European political integration across countries and over time. The candidate will analyze large textual datasets—including newspaper editorials, parliamentary speeches, educational materials—to identify and compare narratives about European integration. It will also help us conduct AI assisted interviews with a representative sample of European respondents, to measure which mental models are used in thinking about

	European integration. The research will involve the use of computational methods, including natural language processing and text analysis, to examine how these narratives evolve, differ across political contexts, and influence citizens' beliefs. The ideal candidate will be an expert in computer science, data science, computational social science, possibly with some background economics in economics or other social sciences. Strong programming skills (e.g., Python or similar), familiarity with text analysis and machine learning methods, and an interest in current issues related to European integration are highly desirable.

DECODE Decoding the Language of Single-Cell Gene Regulation with Transformers CUP J53C25002180001 - FIS-2024-02465	
Scientific Area	Computer Science (INFO-01/A)
Principal Investigator	Prof. Andrea TANGHERLONI
Places available with fellowship	1
Start date	1st September 2026
Project overview	Single-cell multi-omics technologies, such as scRNA-seq (single-cell RNA sequencing, which profiles gene expression in individual cells) and scATAC-seq (single-cell Assay for Transposase-Accessible Chromatin using sequencing, which profiles chromatin accessibility), have dramatically advanced our understanding of cellular diversity and gene regulation. Public repositories now host tens of millions of single-cell profiles, yet effectively integrating these modalities to reconstruct Gene Regulatory Networks (GRNs) remains a major open challenge. Current methods suffer from oversimplified assumptions about linear relationships, separate analysis of each omics layer, loss of critical cross-modal insights, reliance on correlation rather than causation, and static modelling that fails to capture regulatory dynamics. A new generation of computational frameworks is needed to exploit the full scale and complexity of these data. The DECODE project addresses this challenge by developing a novel transformer-based computational framework that integrates scRNA-seq and scATAC-seq data to construct comprehensive models of gene regulation. The framework consists of three components: two specialized single-omics models—one for gene expression and one for chromatin accessibility—trained independently on large-scale atlases, and a cross-modal model that integrates the learned features from both modalities to identify regulatory interactions between genes and regulatory elements. All three models are built on an innovative mechanism that enables each gene or peak to attend to the full vocabulary while controlling computational complexity, overcoming a key limitation of the existing models. The biological applications of the framework focus on two critical areas. The first is the human immune system, investigating hematopoietic development and T cell differentiation to identify regulatory mechanisms underlying immune responses and inflammation. The second is Triple-Negative Breast Cancer (TNBC), where the framework will model cancer-specific regulatory networks and mechanisms of therapeutic resistance to identify novel drug targets. These efforts are expected to advance biomedical research by uncovering actionable mechanisms and accelerating the development of new therapies. Experimental validation through CRISPR perturbation experiments and a comprehensive

	benchmarking suite will generate robust tools and reference standards for the broader research community. The PhD candidate will join a research group at Bocconi University dedicated to AI applied to biology and medicine, working alongside postdoctoral researchers and collaborating with experimental biologists. The project offers a unique opportunity to contribute to a large-scale, well-funded research program spanning the design of deep learning architectures, multi-omics data integration, gene regulatory network inference, and translational applications in immunology and oncology.
Research objectives	The first objective is to help design, implement, and pre-train the single-omics models for scRNA-seq and scATAC-seq data. This includes building efficient training pipelines to stream data from public atlases such as the CELLxGENE Census. It also involves implementing and evaluating multitask curriculum learning strategies (e.g., masked language modelling, expression regression, and denoising. The candidate will systematically study the effect of model capacity, data volume, and attention mechanisms on representation quality. These models must scale to millions of cells, ensuring computational efficiency through mixed-precision training and multi-GPU parallelism. The second objective is to help develop and evaluate the cross-modal model that integrates gene expression and chromatin accessibility representations. The candidate will investigate training strategies for this integration. The candidate will also evaluate the quality of the inferred gene regulatory networks against experimental regulatory databases such as ENCODE (Encyclopedia of DNA Elements, a resource for functional elements in the genome), ChIP-Atlas (database for chromatin immunoprecipitation data), and RegNetwork (database of regulatory relationships), as well as perturbation screen data (experimental data showing effects of systematic gene modifications). The third objective focuses on biological applications of the framework. The candidate will use the trained models to investigate gene regulation in the human immune system and Triple-Negative Breast Cancer. They will perform comparative analyses between healthy and diseased conditions to find dysregulated gene programs and potential therapeutic targets. This work involves close collaboration with experimental partners. These partners will conduct CRISPR-based validation of key predicted regulatory interactions. The candidate will have a unique chance to bridge computational predictions and experimental biology. The fourth objective is to help develop a comprehensive benchmarking suite for single-cell foundation models. This includes defining standardized evaluation tasks such as imputation, clustering,

	cell-type annotation, batch correction, trajectory inference, and GRN inference. It also involves implementing computational and biological evaluation metrics. The candidate will conduct rigorous statistical comparisons with existing methods. Results will be published in top venues in both machine learning (NeurIPS, ICML, ICLR) and computational biology (Nature Methods, Genome Biology, Bioinformatics).
Profile of the candidate	The ideal candidate holds a Master's degree (or equivalent) in Computer Science, Data Science, Bioinformatics, Biotechnology, Mathematics, Physics, or Artificial Intelligence, with a strong quantitative background and interest in interdisciplinary research. Candidates from computational backgrounds should show curiosity toward biology. Candidates from life sciences should demonstrate solid programming and machine learning knowledge. A background in deep learning is highly desirable. Proficiency in Python and in scientific computing tools (PyTorch, NumPy, pandas) is essential. Experience with GPU-accelerated training, distributed computing, and HPC environments is a plus. Familiarity with single-cell analysis tools or genomic data formats is welcome, but not required. Training in computational biology will be provided within the project. Comfort with large-scale datasets is expected. The candidate is expected to demonstrate strong analytical and problem-solving skills, the ability to work independently while contributing to a collaborative research environment, and excellent written and oral communication skills in English. Prior research experience—evidenced by a Master's thesis in a related area, publications, or contributions to open-source projects—will be a plus. The position is based at Bocconi University, in a research group focused on AI for biology and medicine. The candidate will have access to dedicated GPU infrastructure, cloud computing, large-scale single-cell data, and an interdisciplinary setting spanning computer science, statistics, and the life sciences. The PhD program enables international collaborations, conference attendance, and research visits. The selected candidate is expected to begin their doctoral studies in accordance with the university calendar.