



European Lighthouse of AI for Sustainability

Deliverable number 4.1

Date: 4.1

First annual report on the Young Talents program implementation

Project Title ELIAS - European Lighthouse of AI for Sustainability
Contract No. 101120237
Start of Project 1 September 2023
Duration 48 months



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101120237.



Logs

Deliverable title	First annual report on the Young Talents program implementation
Deliverable number	D4.1
Deliverable version	1.0
Previous version(s)	-
Contractual date of delivery	August 31, 2023
Actual date of delivery	August 20, 2024
Deliverable filename	ELIAS_D4.1.pdf
Nature of deliverable	Report
Dissemination level	Public
Number of pages	17
Work Package	WP4
Task(s)	T4.1
Partner responsible	IPP
Author(s)	Charlotte Delage
Editor	zzz (zzz)
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Abstract	This report is the first deliverable of Work Package (WP) 4, Task 1: ' <i>Implementation of the Young Talents program in Sustainable AI (T4.1)</i> ' and presents updates that have occurred within the first year of the ELIAS project
Keywords	PhD program, PhD students, Gender representation, Sustainability topics, events, WP4

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Version	Date	Reviewer	Modifications
0.1	10/05/2023	xxx (UNITN)	Initial version, Table of contents and sections

The information and views set out in this report are those of the author(s) and do not necessarily reflect the official opinion of the European Union. Neither the European Union institutions and bodies nor any person acting on their behalf.

Table of Abbreviations and Acronyms

Abbreviation	Meaning
AI	Artificial Intelligence
CR	Central Recruitment
EDS	ELLIS DOCTORAL SYMPOSIUM
ELLIS	European Laboratory for Learning and Systems
IPP	Institut Polytechnique Paris
ML	Machine Learning
T4.1	Task 4.1
WP	Work Package

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1 Executive Summary

This report is the first deliverable of Work Package (WP) 4, Task 1: '*Implementation of the Young Talents program in Sustainable AI (T4.1)*' and presents updates that have occurred within the first year of the ELIAS project. Specifically:

- How ELIAS research topics and values were integrated into the 2023-2024 call for ELLIS PhD students
- Highlights of the results and overall statistics of the 2023-2024 call for ELLIS PhD students
- Introduction of the Interdisciplinary Track for Sustainable AI recently added to the ELLIS/ELIAS PhD & Postdoc program
- Organisation of a major scientific event supported by ELIAS (ELLIS Doctoral Symposium edition 2024 for PhD students and Postdocs: AI & Sustainability) to reinforce and strengthen the new centre of excellence in Sustainable AI.
- Connecting with AIDA by offering talks from ELIAS partners
- Presentation of other relevant events fostering the growth of young researchers in sustainable AI from the ELLIS network

2 Introduction

ELIAS, the European Lighthouse for AI and Sustainability, is strongly connected with ELLIS, a pan-European AI network of excellence founded in 2018. Briefly, ELLIS fosters modern AI research and aims to build a strong community of top researchers across Europe by promoting collaborations between the best Academic institutions and Industries in this field. ELLIS has grown into an extensive entity built on 3 pillars:

- Cutting-edge Research Programs encompassing various AI research areas, from core Machine Learning to more interdisciplinary topics like Health.
- ELLIS Units scattered all over Europe and fostering a strong community across top-rated institutions.
- The PhD & Postdoc program, implemented in 2020, which offers consolidated procedures for the selection and admission of highly qualified PhD students.

WP4 (WP4) of ELIAS, '*Fostering Scientific Excellence in AI*' has 4 goals or '*Tasks*', with the focus of the present deliverable on **Task 4.1: Implement a PhD program for the next generation of talents in Sustainable AI**. As such, WP4 relies on the already existing processes in the aforementioned PhD program to build a new PhD program for ELLIS students and postdocs that reflects ELIAS' goals. Specifically, WP4 aims to transform the ELLIS PhD program into the ELLIS/ELIAS PhD program and intends to direct the program towards sustainability-oriented values, with the overall objectives of 1) reinforcing this world-class AI community and 2) assembling the European Lighthouse for Sustainability.

This report thus presents the actions taken during the first year of the ELIAS project to assemble the ELLIS/ELIAS PhD & Postdoc program (using the existing procedures as a solid base) and develop a series of initiatives to support the young talents of the ELLIS network.

Firstly, the central recruitment process (CR), a yearly call to recruit new PhD students into ELLIS, will be discussed, as well as the first steps undertaken to attract students and advisors already partaking in ELIAS or simply interested in pursuing sustainability topics. Then, the statistics of the 2023/2024 call will be presented, along with the number and gender of PhD students focusing on sustainable topics in the upcoming cohort. Secondly, a newly implemented track in the ELLIS PhD & Postdoc program will be introduced, fully supporting research topics in sustainable AI. Finally, events for ELLIS PhD students occurring within the first year of the ELIAS project will be listed and briefly described; how they promote sustainable AI will be explicitly stated.



Figure 1. Timeline of the ELLIS PhD & Postdoc program governance and funding

3 The ELLIS/ELIAS PhD & Postdoc program

The ELLIS PhD & Postdoc program was implemented in 2020 and received funding from the European Union’s Horizon Europe research and innovation program (grant agreement No. 951847: ELISE); it was first coordinated by the University of Tübingen (Germany), an ELISE Beneficiary. Once the ELISE project is completed, the overall coordination of the PhD & Postdoc program will switch from the University of Tübingen to Institut Polytechnique de Paris (IPP), the leading institution in charge of WP4 of ELIAS. With ELISE ending in August 2024 and ELIAS having started in September 2023, Year 1 of the ELIAS project was thus a transition period where the existing coordination of the PhD & Postdoc program was progressively handed to IPP:

- Transfer of the Chairman position of the ELLIS PhD Committee to Pr. Florence d’Alché-Buc (IPP and Work Package 4 leader).
- Recruitment of a new ELIAS coordinator for WP4 at IPP (Dr. Charlotte Delage) and weekly WP4 (task 1) meetings.
- Knowledge transfer between the ELISE and ELIAS coordinators (remote weekly meetings and in-person meetings at Tübingen).

A summary of the aforementioned timeline as well as a list of the current ELLIS PhD Committee members are found in **Figure 1**.

The ELLIS PhD Committee is constituted of senior researchers in AI or Machine Learning (ML) who develop the strategic agenda to attract and support the next generation of AI researchers; they rotate out on a regular basis. As part of the ELIAS project, new members focusing on sustainability topics will further be invited to join the committee.

3.1 Introduction of ELIAS values and goals in Central Recruitment call (2023-2024)

The ELLIS network opens a call for new PhD students every year, typically from September to mid-November (see: <https://ellis.eu/news/ellis-phd-program-call-for-applications-2023>). The application portal (<https://apply.ellis.eu>), hosted on the ELLIS Society server, allows hiring advisors from the ELLIS network and prospective PhD students to register and match through a rigorous selection process (pre-screening and interviews); shortlisted students are hired from all over the

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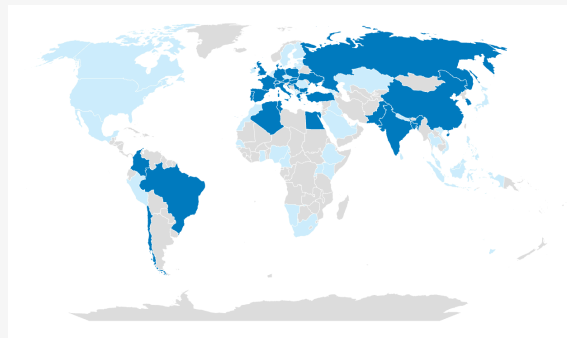


Figure 2. Distribution of applications across the globe. Countries in dark blue account for at least one accepted applicant.

Gender	PhD Applications			PhD Applications related to ELIAS topics	
	Released	Accepted	Percentage (%)	Accepted	Percentage (%)
Men	1057	91	75	39	74
Women	340	27	22	14	26
No information	17	3	3	0	0

Table 1. Gender representation for the 2023-2024 ELLIS/ELIAS Recruitment call for PhD students

world and join a top-rated academic institution in Europe (**Figure 2**).

To better represent ELIAS (especially the research areas in WP1-3) and promote research in sustainability, relevant keywords were incorporated into the research interests portion of the application for the ELLIS PhD call:

- Robust & Trustworthy ML
- ML in Chemistry & Material Sciences
- Interpretability & Fairness
- ML & Sustainability
- Earth & Climate Sciences
- Law & Ethics

Interest of prospective PhD students for these topics was as follows: 37% of applications featured at least one of the above keywords as a research interest, with 44% of the shortlisted students having selected at least one of those keywords. Gender representation of those applicants is illustrated in **Table 1**, as well as the representation from the initial pool of applicants to the final selection.

A total of 121 students (9% of applicants) were recruited following the 2023-2024 call, whilst 225 advisors participated in the review process; around 30% were employed at an ELIAS partner. Mirroring this trend, roughly 30% of selected students joined an institution in the ELIAS network. How these numbers reflect on the actual topic for the PhD theses is unknown at the time during which this report is written; once students have received an offer from a hiring advisor to join

	Main Advisor	Co-Advisor
Supervision	ELLIS Fellow/Scholar	Tenured faculty*
Location	Same city/university/country allowed	
Exchange	6-month visit with the co-advisor**	
Partitioning	50% of time with Main advisor	

Table 2. Eligibility requirements for the Interdisciplinary Track in Sustainable AI. *The co-advisor can also be an ELLIS Fellow/Scholar as long as they are a researcher in a non ML/AI field; **If both advisors are in the same university/city, no exchange is required but a one-month visit abroad is however encouraged.

the ELLIS/ELIAS PhD & Postdoc program (typically in early May), they have until September to submit a letter of intent with all the details pertaining to their PhD (i.e., duration, name of advisors, abstract of thesis,...). As such, relevant data will be available for deliverable D4.2.

3.2 Interdisciplinary Track for Sustainable AI

The ELLIS/ELIAS PhD & Postdoc program currently offers two different tracks, based on the joint supervision the student receives; each of them have their own requirements and specificity:

1) **Academic Track:** the PhD student is co-supervised by at least one ELLIS Fellow/scholar/Unit faculty and one ELLIS Fellow/scholar/Unit faculty/member, both located in Europe; the student conducts a 6-month research exchange at the co-advisor's university, which must be in a different country than the home institution.

2) **Industry Track:** the PhD student is co-supervised by at least one ELLIS Fellow/scholar/Unit faculty and one industry partner (an ELLIS Fellow/scholar/Unit faculty/member); both may be located in the same country. The student conducts a 6-month research exchange with the industry partner and spends at least 50% of his/her time with his academic advisor.

To promote PhD theses in link with sustainable research, these two tracks were used as a base to build the newly implemented third track which was then inserted into the program: the **Interdisciplinary Track**. The specificity of this track is that it allows for a joint supervision between an ELLIS Fellow/scholar and a tenured faculty whose main expertise is not ML/AI; this "interdisciplinary" co-advisor can be a researcher in diverse fields such as biology, law, social sciences and humanities, climatology, etc. (see <https://ellis.eu/phd-postdoc> for more information).

Eligibility requirements have been thoroughly discussed in WP4 meetings and are listed in (Table 2) 3.

The Interdisciplinary Track was launched in May 2024; given the research interests of the selected ELLIS PhD students for the 2023-2024 call (see previous section), it is expected that part of this new cohort will pursue this track. More information will be available for deliverable D4.2.

4 Activities

4.1 ELLIS Doctoral Symposium 2024 on AI and Sustainability

The first event organised by ELIAS within the framework of WP4.1 is the ELLIS Doctoral Symposium (EDS) that is held in Paris from Aug 26 to Aug 30. The EDS is a cornerstone of the ELLIS PhD program and takes place each year in a different place in Europe. This year, it focuses on AI and Sustainability. PhD students will enjoy various scientific sessions (keynote talks, posters presentations, etc.), a contact with Industry and entrepreneurship through an industry fair, and various possibilities of networking in the form of multiple social events. Within the scope of ELIAS, this symposium provides the opportunity to train and introduces a generation of PhD students to AI as a tool for addressing sustainability issues and sustainability as an angle to AI. The program directly aligns with the 3 pillars of ELIAS (WP 1, 2 and 3). Participants are ELLIS PhD students at different stages of their thesis, ELLIS Postdocs or local PhD students. While IPP (an ELIAS Beneficiary) is the main organiser, ELISE co-organises this event while ELSA also contributes by offering additional mobility funds for their students, thus enabling the three networks to collaborate.

4.1.0.1 Key points about EDS2024 The event (see: <https://eds2024.github.io>) currently has around 130 participants; it contributes to WP4 and further reinforces the new centre of excellence in Sustainable AI; the main theme of the symposium is '*AI& Sustainability*' and features Keynote speakers discussing research topics in link with WP1-3 of ELIAS:

- **Devis Tuia (EPFL)** - Machine learning for Earth: monitoring the pulse of our Planet with sensor data, from your phone all the way to space
- **Gaël Varoquaux (INRIA)** - AI from tabular data to healthcare and society
- **David Rolnick (McGill University and Mila - Quebec AI Institute)** - Tackling climate change with machine learning: An opportunity for application-driven innovation.
- **Caroline Therwath-Chavier** - AI²: why Artificial Intelligence should be All Inclusive
- **Rita Cucchiara (UNIMORE)** - Learning, Unlearning and ReLearning in the embedded space

In these keynotes, the ELIAS network is represented by Gaël Varoquaux and Rita Cucchiara, whose institutions are part of the consortium. Additionally, Gregor von Dulong (HPI) will promote WP5 of ELIAS in a short talk taking place during an entrepreneurship session while Claire Robin (MPG), a newly admitted ELLIS PhD student, will present her research for Use Case 5 of the ELIAS project (*AI for forecasting of vegetation state*).

Additionally, participating industries/startups were also selected based on their involvement with sustainable topics; for instance, DC Brain (<https://dcbrain.com/en/>) or Qarnot (<https://qarnot.com/en/>).

4.2 AIDA Excellence Lecture Series

Part of T4.1 is dedicated to the reinforcement of the connections with AIDA (AI Doctoral Academy) through ELIAS. **The AIDA Excellence Lecture Series** (see: https://www.i-aida.org/event_cat/ai-lectures/) is a free weekly seminar given by Senior or promising junior scientist in AI and intended for PhD students.

Over the past year, several ELIAS researchers have been selected to give a talk:

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- **Dr. Markus Reichstein (MPG)** - Deep learning and Process Understanding for Data-Driven Earth System Science
- **Gustau Camps-Valls (UVEG)** - Hybrid & Causal Machine learning in the Earth sciences
- **César A. Hidalgo (ANITI)** - Economic Complexity and Sustainable Growth
- **Josef Sivic (CTU)** - Learning manipulation skills from instructional videos

The subject of these talks is in line with WP1-3 of ELIAS.

Additionally, the **Centre for Research and Technology Hellas (CERTH)** hosted a Network of Excellence community workshop as well as an AIDA symposium (see:)

4.3 Other events

The Human-Centric Machine Learning (HCML) Reading Group, managed by the ELLIS PhD students of Alicante, organised its annual workshop (see: <https://ellisalicante.org/ellis-hcml-2024>); this event is in line with the research conducted in WP3 of ELIAS.

5 Future Directions

This document presented updates on Work Package 4, Task 1: *'Implementation of the Young Talents program in Sustainable AI'* of ELIAS, one year into the project.

This first year was a transition period as the coordination of the ELLIS PhD & Postdoc program transited from the University of Tübingen to IPP. Nevertheless, decisive steps were taken in order to build the European Lighthouse for Sustainability and the ELLIS/ELIAS PhD & Postdoc program:

- Implementation of the Interdisciplinary Track for Sustainable AI
- ELLIS Central Recruitment call: addition of keywords in link with sustainability in the application form
- Several events promoting ELIAS and reinforcing the existing ELLIS network at the PhD level.

A first overall analysis of the available data demonstrates the interest of the community for such topics as those tackled by ELIAS. Further steps will include:

- Monitoring the topic of the PhD theses of the new ELLIS cohort and assessing the percentage focusing on sustainability topics.
- Promote the Interdisciplinary track through social media and evaluate the number of students selecting this track.
- Increase the gender equality in the CR call by promoting success stories from female ELLIS PhD students on the ELLIS channels and enabling women in the network to have more visibility.
- Increase the representation of ELIAS researchers in the upcoming CR calls through the addition of sustainable research topics.
- Invite relevant ELIAS Researchers to join the PhD committee.

Lars

References