



Fundamentals of Artificial Intelligence

Centre for Doctoral Training

Virtual Open Day 2025



UNIVERSITY OF
OXFORD

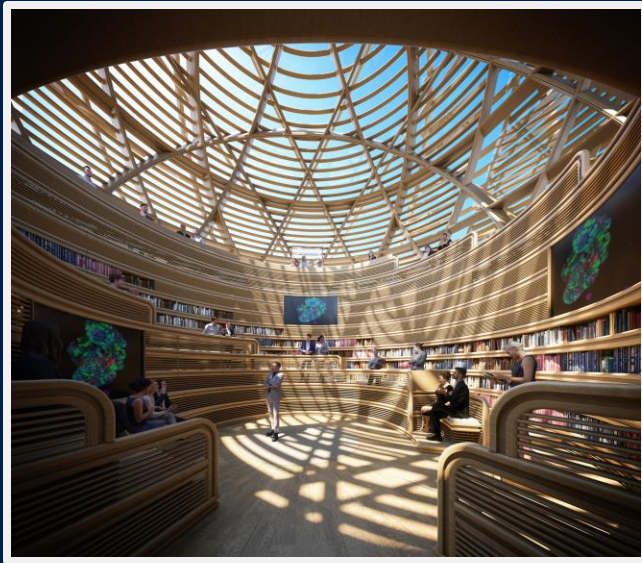


Advancing the foundational principles of artificial intelligence to accelerate scientific discovery

Nurture

**Support your personal
development as artificial
intelligence researchers and to
realise your talent and potential**



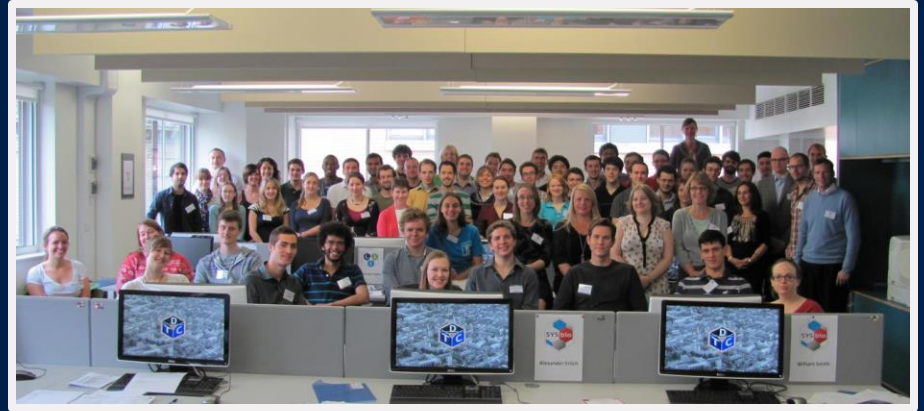


Change

Working with the Ellison Institute to develop artificial intelligence that has the potential to drive transformative impact across key global challenges

Collaboration

To work together in partnership
within communities to combine
our strengths and knowledge



Areas of focus



**Theory &
Foundations**



**Applied
Fundamentals**



**Systems &
Engineering**

Areas of focus

Theory & Foundations

Applied Fundamentals

Systems & Engineering

Mathematical and computational theory that underpins core learning and modelling approaches

...ing is at [29] focus on non-parametric models including a sequence of non-parametric models using copulas. Specifically, they take

$$P_{n+1}(t) = (1 - a_n)P_n(t) + a_n \{f(P_n(t), P_n(t_{n+1}))\} \quad (2.2)$$

where the weights are of the form $a_n = 1/(n+1) \rightarrow 0$ and f is a partial derivative of a Gaussian copula function with correlation parameter ρ . That is $f(u, v) = \partial C_\rho(u, v)/\partial u$, which yields

$$f(u, v) = \phi \left(\frac{\phi^{-1}(u) - \rho \phi^{-1}(v)}{\sqrt{1 - \rho^2}} \right)$$

The sequence $\{P_n\}_{n=1}^\infty$ forms a martingale when the x_{n+1} comes from $P_n(\cdot)$. The sequence converges to the distribution estimator $\hat{P}_\infty$ from the observed sample $x_{1:n}$. Convergence of $\{P_n\}_{n=1}^\infty$ to a random distribution function follows from: Barzi et al. [29]. The limit $\hat{P}_\infty$ is regarded as a random draw from the martingale posterior distribution.

The use of copulas here should not come as any great surprise. Consider the Bayesian predictive density given by

$$p(y | x_{1:n}) = \frac{\int p(y, \theta) p(\theta | x_{1:n}) d\theta}{p(x_{1:n} | x_{1:n})}$$

which can be written as

$$p(y | x_{1:n}) = p(y | x_{1:n}) \frac{\int p(y, \theta | x_{1:n}) d\theta}{p(y | x_{1:n}) p(x_{1:n} | x_{1:n})}$$

The fraction part on the right is a copula density function, which can be written as

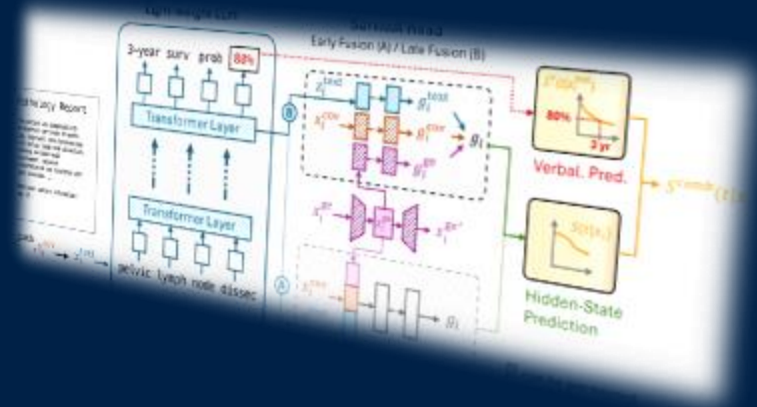
Areas of focus

Theory & Foundations

Applied Fundamentals

Systems & Engineering

Theoretical and methodological challenges posed by scientific applications



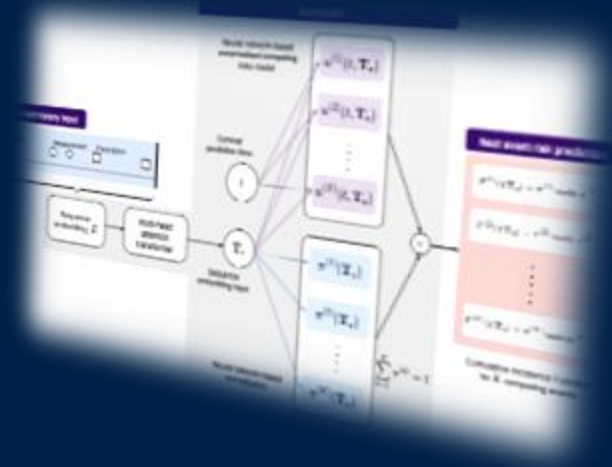
Areas of focus

Theory & Foundations

Applied Fundamentals

Systems & Engineering

Novel fundamental challenges posed by the emergence of large-scale AI systems



Programme Structure

Four-year doctoral training programme:

Year 1

Software Engineering Training
Two taught courses in classical and modern aspects of artificial intelligence

Years 2-4

Group project
Two individual rotation projects
DPhil research project

Programme Structure

Four-year doctoral training programme:

Year 1

Transfer to host university department under new supervision

Years 2-4

Conduct three years of focused research

Graduate with DPhil and future career ...

Who are we looking for

Technical capability and potential

Benefit from cohort-
based training

Alignment to EIT

You can demonstrate the mathematical and computational capability to conduct doctoral-level research in fundamental artificial intelligence through:

- Strong academic performance
- Internships and post-graduate work experience
- Other research activities

Who are we looking for

Technical capability
and potential

You are still undecided on your research
direction.

**Benefit from cohort-
based training**

You want to work and learn with other like-
minded people.

Explore new areas and topics.

Alignment to EIT

If you already know you want to work on a
specific topic with a particular academic,
consider other programmes.

Who are we looking for

**Technical capability
and potential**

**Benefit from cohort-
based training**

Alignment to EIT



**You have interests in scientific areas relevant to
EIT scientific programmes**

How will you be supported

Stipend and fees

Research training
and support funds

EIT Development and
Support

Students receive:

- Four-year stipend
- Tuition fees (home and international)
- Immigration charges (for international students)

How will you be supported

Stipend and fees

**Research training
and support funds**

EIT Development and
Support

All Year 1 activities are fully funded.

Funding to support research and training
activities in Years 2-4 of your studies.

How will you be supported

Stipend and fees

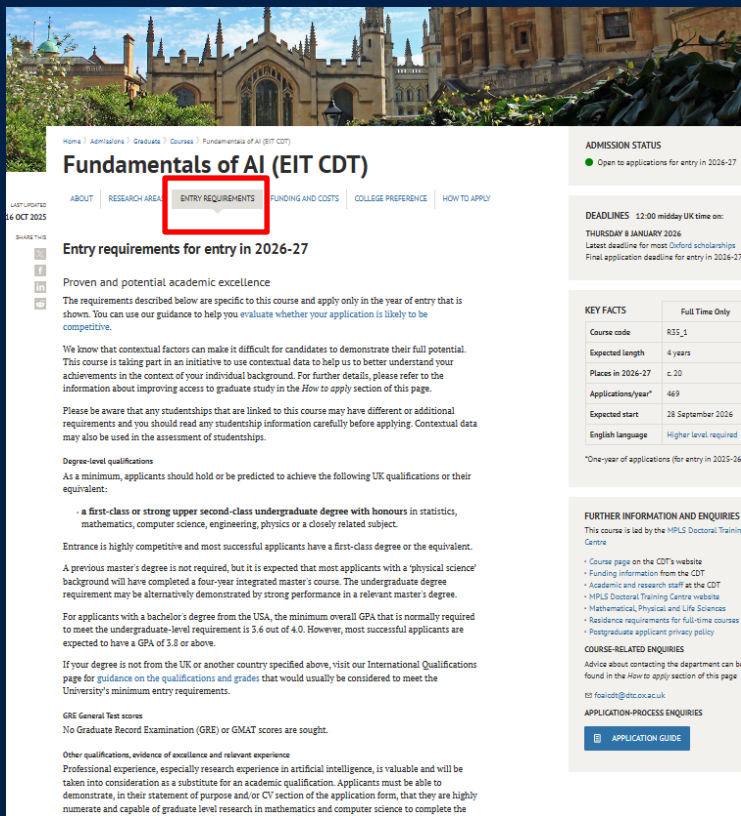
**Research training
and support funds**

**EIT Development and
Support**

**EIT-led Leadership and personal development
programme alongside other EIT Scholars and
Graduates**



How to apply



GRADUATE COURSES INTERNATIONAL APPLICANTS APPLICATION GUIDE WHY STUDY AT OXFORD? COLLEGE LIFE FEES AND FUNDING AFTER YOU APPLY INCREASING ACCESS

Home > Admissions > Graduate > Courses > Fundamentals of AI (EIT CDT)

Fundamentals of AI (EIT CDT)

ABOUT RESEARCH AREA **ENTRY REQUIREMENTS** FUNDING AND COSTS COLLEGE PREFERENCE HOW TO APPLY

LAST UPDATED: 16 OCT 2025

Entry requirements for entry in 2026-27

Proven and potential academic excellence

The requirements described below are specific to this course and apply only in the year of entry that is shown. You can use our guidance to help you evaluate whether your application is likely to be competitive.

We know that contextual factors can make it difficult for candidates to demonstrate their full potential. This course is taking part in an initiative to use contextual data to help us to better understand your achievements in the context of your individual background. For further details, please refer to the information about improving access to graduate study in the *How to apply* section of this page.

Please be aware that any studentships that are linked to this course may have different or additional requirements and you should read any studentship information carefully before applying. Contextual data may also be used in the assessment of studentships.

Degree-level qualifications

As a minimum, applicants should hold or be predicted to achieve the following UK qualifications or their equivalent:

- a first-class or strong upper second-class undergraduate degree with honours in statistics, mathematics, computer science, engineering, physics or a closely related subject.

Entrance is highly competitive and most successful applicants have a first-class degree or the equivalent.

A previous master's degree is not required, but it is expected that most applicants with a 'physical science' background will have completed a four-year integrated master's course. The undergraduate degree requirement may be alternatively demonstrated by strong performance in a relevant master's degree.

For applicants with a bachelor's degree from the USA, the minimum overall GPA that is normally required to meet the undergraduate-level requirement is 3.6 out of 4.0. However, most successful applicants are expected to have a GPA of 3.8 or above.

If your degree is not from the UK or another country specified above, visit our International Qualifications page for guidance on the qualifications and grades that would usually be considered to meet the University's minimum entry requirements.

GRE General Test scores

No Graduate Record Examination (GRE) or GMAT scores are sought.

Other qualifications, evidence of excellence and relevant experience

Professional experience, especially research experience in artificial intelligence, is valuable and will be taken into consideration as a substitute for an academic qualification. Applicants must be able to demonstrate, in their statement of purpose and/or CV section of the application form, that they are highly numerate and capable of graduate level research in mathematics and computer science to complete the

ADMISSION STATUS

● Open to applications for entry in 2026-27

DEADLINES

12:00 midday UK time on:
THURSDAY 8 JANUARY 2026
Latest deadline for most Oxford scholarships
Final application deadline for entry in 2026-27

KEY FACTS

	Full Time Only
Course code	R35_1
Expected length	4 years
Places in 2026-27	c 20
Applications/year*	469
Expected start	28 September 2026
English language	Higher level required

*One-year of applications (for entry in 2025-26)

FURTHER INFORMATION AND ENQUIRIES

This course is led by the HPLS Doctoral Training Centre

- Course page on the CDT's website
- Funding information from the CDT
- Academic and research staff at the CDT
- HPLS Doctoral Training Centre website
- Mathematical, Physical and Life Sciences
- Residence requirements for full-time courses
- Postgraduate applicant privacy policy

COURSE-RELATED ENQUIRIES

Advice about contacting the department can be found in the *How to apply* section of this page

Dr foaloch@dpcc.ox.ac.uk

APPLICATION-PROCESS ENQUIRIES

APPLICATION GUIDE

Check Entry Requirements on the official course page at
www.ox.ac.uk/admissions/graduate/courses/fundamentals-of-ai

GRADUATE COURSES INTERNATIONAL APPLICATIONS APPLICATION GUIDE WHY STUDY AT OXFORD COLLEGE LIFE FEES AND FUNDING AFTER YOU APPLY INCREASING ACCESS

Fundamentals of AI (EIT CDT)

Home / Admissions / Graduate / Courses / Fundamentals of AI (EIT CDT)

ABOUT RESEARCH AREAS ENTRY REQUIREMENTS FUNDING AND COSTS COLLEGE PREFERENCES **HOW TO APPLY**

18 OCT 2025

Before you apply

Our guide to getting started provides general advice on how to prepare for and start your application, including advice to help you evaluate whether your application is likely to be competitive.

It is important for you to have your application considered under a particular deadline – eg under the January deadline in order to be considered for Oxford scholarships – we recommend that you aim to complete and submit your application at least two weeks in advance. Check the deadlines on this page and the information about deadlines and when to apply in our Application Guide.

- Application fee waivers
- Do I need to contact anyone before I apply?

Improving access to graduate study

This course is taking part in initiatives to improve the selection procedure for graduate applications, to ensure that all candidates are assessed fairly:

Contextual data (where it has been provided in the application form) and your contextual statement (if you choose to provide one) will be used as part of an initiative to contextualise applications at the different stages of the selection process. When academic shortlisting takes place, we will use also information on ethnicity as part of an initiative to ensure that applicants who identify as Black British and meet the relevant criteria are invited to interview.

Completing your application

You should refer to the information below when completing the application form, paying attention to the specific requirements for the supporting documents.

For this course, the application form will include questions that collect information that would usually be included in a CV/resumé. You should not upload a separate document. If a separate CV/resumé is uploaded, it will be removed from your application.

If any document does not meet the specification, including the stipulated word count, your application may be considered incomplete and not assessed by the academic department. Expand each section to show further details.

- Proposed field and title of research project
- Proposed supervisor
- References: Three overall
- Official transcript(s)
- Contextual statement
- Statement of purpose: A maximum of 1,200 words

Start or continue your application

You can start or return to an application using the relevant link below. As you complete the form, please refer to the requirements above and consult our Application Guide for advice.

[→ APPLY](#) [→ CONTINUE APPLICATION](#)

After you've submitted your application

Your application (including the supporting documents outlined above) will be assessed against the entry requirements specified on this course page. Additionally, an interview will be arranged for all successful applicants.

ADMISSION STATUS

Open to applications for entry in 2024-27

DEADLINES

12:00 Midday UK time on:
THURSDAY 8 JANUARY 2025
Latest deadline for most Oxford scholarships
Final application deadline for entry in 2024-27

KEY FACTS

	Full-Time Only
Course code	R12.1
Expected length	4 years
Places in 2024-27	6-20
Applications/year	400
Expected start	28 September 2026
English language	Higher level required

*One year of applications for entry in 2024-26

FURTHER INFORMATION AND ENQUIRIES

This course is led by the HPLS Doctoral Training Centre.

- Course page on the CDT's website
- Funding information from the CDT
- Academic and research staff at the CDT
- HPLS Doctoral Training Centre website
- Mathematics, Physical and Life Sciences
- Postgraduate application privacy policy

COURSE-RELATED ENQUIRIES

Advice about contacting the department can be found in the How to apply section of this page or by email to cdt@hpl.su.ox.ac.uk

APPLICATION PROCESSES ENQUIRIES

[APPLICATION GUIDE](#)

How to apply

Check Entry Requirements on the official course page at www.ox.ac.uk/admissions/graduate/courses/fundamentals-of-ai

Start your application via the ‘Apply’ button on the course page (Oxford eVision).

You can apply for up to three graduate courses in one admissions cycle (max two taught).

Your statement should be written in English and should focus on your motivation, research interests and career ambitions in the area of the CDT, rather than on other personal achievements, interests and aspirations.

Your personal statement must be structured as follows, and answer each of the questions in individual separate sections.

Please be as specific and detailed as possible in your answers. If possible, please ensure that the word counts are clearly displayed on the document.

Please include the question as headings to each section. The question itself need not contribute towards the word count.

You may also use your personal statement to explain any special circumstances relating to any element of your application that you wish to bring to the attention of the assessors.

1. Give an overview of your academic education and professional career to date and how it led to an interest in conducting research in the fundamentals of AI? [250 words]
2. Describe a research project you have undertaken that involved the development of AI theory or methods. What was the problem you addressed? What was your contribution to the development of AI? Explain why an existing, off-the-shelf solution could not be used? [Up to 400 words]
3. Describe a situation where you once made a programming error. How did you discover the error? How did you trace the source of the error? And how was it resolved? [Up to 250 words]
4. What makes the FOAI CDT more appropriate to you than other options for doctoral study? [Up to 150 words]
5. How could your interests support one or more of the [EIT themes](#)? [Up to 150 words]
6. *If you are invited for interview, you will be asked to undertake some technical exercises. In order to help us determine appropriate questions for you, please tell us your current primary area of interest by selecting one option (**ONLY**) from the following:
 - Foundations
 - Applied
 - Systems

How to apply

You are **not** expected to contact prospective supervisors prior to application.

Please leave 'Field and title of research project' **blank** on the 'Course' tab of the application form.

You should include a **Statement of Purpose** following the template provided.

Further information:
<https://www.foaicdt.ox.ac.uk/>

How to apply

How to Apply - please read the instructions on how to apply carefully. Your statement of purpose must be structured as requested, and answer each of the questions in individual separate sections

+ Expand All

How are we improving access to graduate study	▼
Entry requirements	▼
How do I apply?	▼
Download a template for the Statement of Purpose	▼
Should I contact a supervisor before I apply	▼
Should I include a research proposal in my application form?	▼
What are you looking for in an applicant?	▼
Is there a charge to apply	▼
Will there be an interview?	▼
Can I use AI to create my application documents?	▼

References

Register three referees; ensure at least two are received by the deadline for a complete application

Pay the application fee

£20 per application for this CDT; fee waivers available for eligible applicants

Submit the form; manage any updates via Graduate Applicant Self-Service.

Further information:

<https://www.foaicdt.ox.ac.uk/>

Key Information

Programme code: R35_1 (full-time DPhil, length 4 years)

Deadline: 12:00 midday UK time, Thursday 8 January 2026 (final deadline & latest for most Oxford scholarships)

Funding: By applying to the CDT, you are automatically considered; most offers are expected to include a fully-funded scholarship (fees + stipend).

Admission status: Open to applications for 2026/27 entry; c.20 places.

Aim to submit at least two weeks before the deadline; references and documents must be in by the deadline.

English language: Higher level required.

Interview Process

Interviews are normally held as part of the admissions process and are expected to be held in **February or March**.

Interviews will be held **online**, normally with at least two interviewers from the supervision pool and one from EIT.

Prior to interview you may be required to prepare a short video highlighting your interest in a topic related to EIT and the CDT.

In some cases, you may be invited back for a second interview.

Interviews will focus on technical aspects, specifically your foundational mathematical, statistical and computational skills, your appetite to engage with cohort activities, and your commitment to innovation to solve global problems through technological advancements.

Frequently Asked Questions

Do I need to have published before I applied?

> This is not a requirement. Though it may form part of the evidence for your technical ability and interests.

Can I undertake part-time or remote study?

> The programme is intended for full-time, in-person study. Contact us for further details if you have particular circumstances.

I have an unfunded offer for another DPhil programme. Can the CDT provide funding?

> This CDT does not provide scholarships for other university schemes.

Questions and Answers

<https://www.foaicdt.ox.ac.uk/>

Contacts

FoAI CDT Programme Manager: foaicdt@dtc.ox.ac.uk

General enquiries (MPLS Doctoral Training Centre):
dtcenquiries@dtc.ox.ac.uk

For comprehensive guidance: University of Oxford Graduate Application Guide and the course page

<https://www.ox.ac.uk/admissions/graduate/courses/fundamentals-of-ai>

<https://foaicdt.ox.ac.uk/>