Cambridge Centre for
Innovation and Development©

PROFESSIONAL DIPLOMA

ARTIFICIAL INTELLIGENCE IN HEALTH AND MEDICINE

10-11 Months
Online (Part-Time)

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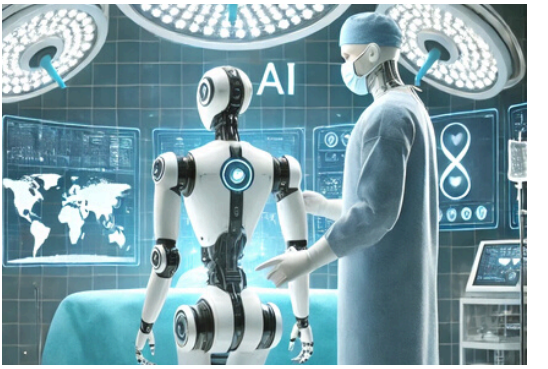
OVERVIEW



The Professional Diploma (PD) in Artificial Intelligence in Health and Medicine is an intensive, multidisciplinary 11-month programme designed to prepare the next generation of researchers, practitioners, and innovators at the intersection of AI and healthcare.

This uniquely curated programme bridges the domains of medicine, computer science, robotics, and communication to address pressing real-world challenges in global health systems through AI-powered solutions.

Designed in collaboration with experts from clinical medicine, AI research, robotics engineering, digital health, and science communication, the programme emphasizes real-world applications and translational research. It integrates theory, computational methods, clinical insights, and communication tools, enabling participants to become leaders in the emerging digital health ecosystem.

Participants will engage in a rich learning experience that blends academic instruction, laboratory simulations, virtual internships, and research immersion. The programme concludes with a capstone research or prototype project that solves a pressing healthcare problem.

Whether you're a medical professional seeking to understand how AI tools can enhance diagnostics, or a technologist aiming to develop robotics or data-driven systems for healthcare, this programme is structured to support multi-disciplinary learners in building cross-functional expertise.

THE VISION BEHIND THE PROGRAMME

As AI technologies mature and become more widely adopted across industries, their transformative potential in healthcare is increasingly evident. From AI-powered clinical decision support to surgical robotics, personalized medicine, and epidemiological modeling, AI is reshaping the way medicine is practiced, managed, and experienced.

Yet, for this transformation to be safe, equitable, and effective, there is an urgent need for professionals who can:

- Understand the clinical context in which AI operates;
- Design responsible and ethical AI systems with a clear grasp of health-specific constraints;
- Collaborate across disciplines to translate research into real-world applications;
- Communicate science and data clearly and persuasively to both professional and public audiences;
- Drive innovation through research, development, and policy.

This diploma is purpose-built to meet these needs. It prepares you to become a bridge-builder between medicine and machine learning, between robotics and rehabilitation, between big data and patient care.

PROGRAMME CONTENT

PART 1: ARTIFICIAL INTELLIGENCE IN MEDICINE

This module is designed to equip you with the knowledge you need to apply AI in medicine. Through the final module, you'll gain the essential knowledge and expertise required to apply AI in medicine and clinical research. This course aims to provide knowledge of AI applications in medicine and healthcare.

Module 1: Introduction to Artificial Intelligence:

Gain a solid understanding of the foundations of AI, its evolution, and the historical milestones that have shaped this cutting-edge field. Whether you're a student, professional, or simply curious about AI, this course provides a concise and engaging overview. Understand the definition and fundamentals of AI.

Explore the potential of AI within the context of research. Delve into the historical development of AI from its inception to the present day.

Module 2: AI and Machine Learning (ML):

Understanding the concepts: Define AI and machine learning and understand their interconnected nature.

PROGRAMME CONTENT

Explore how these technologies are reshaping industries. Examine practical applications of AI and ML across various industries. Learn about the main types of machine learning: supervised, reinforcement, and unsupervised learning.

Module 3: The ethics of AI in healthcare and medicine:

Understand the ethical implications of AI-driven advancements in healthcare. Delve into the critical issues surrounding patient data privacy Examine strategies for safeguarding sensitive healthcare information in the age of AI. Explore the hierarchy of ethical and legal considerations. Gain the knowledge and insights needed to navigate the complex ethical landscape, ensuring that

AI technologies in healthcare uphold principles of fairness, transparency, and patient-centric care.

Module 4: The applications of AI in medicine:

Discover the groundbreaking potential of AI in revolutionizing the field of medicine, with a specific focus on cancer diagnosis, treatment, and research.

PROGRAMME CONTENT

Explore the specific applications of AI in cancer care and treatment. Explore the latest applications of AI in medicine and cancer research performed in international universities. Explore cutting-edge developments in AI and their potential impact on the future of cancer care through research studies.

PART 2: MEDICAL ROBOTICS

Explore the latest advancements in robotic-assisted surgery, gaining knowledge about cutting-edge robotic surgical systems that enhance precision and minimize invasiveness. This course is designed for enthusiasts eager to be at the forefront of medical innovation. Whether you're a surgeon looking to enhance your skills or a student fascinated by the potential of robotics in healthcare, this practical course is your gateway to mastering the future of medicine.

This course is designed to equip you with the knowledge you need to apply robotics in medicine and healthcare. Through the final project, you'll gain the essential knowledge and skills required to implement robotics in medicine and health research.

PROGRAMME CONTENT

This course aims to provide knowledge of robots for surgeries, image-guided intervention, and computer-assisted surgery and therapy.

Module 1: Introduction to robotics:

Build a strong foundation in the principles of robotics, from understanding the history and potential of robotics within the context of medical research. Understand the principles of medical robotics, and understand the unique requirements and applications within the healthcare landscape.

Module 2: Computer-assisted surgery and therapy:

Delve into the intricacies of computer-assisted interventions, discovering how digital precision is revolutionizing surgeries, therapies, and overall patient care. Immerse yourself in therapeutic simulations, where computer-assisted technologies transform the landscape of rehabilitation and treatment. Discover how technology is reshaping therapeutic approaches and optimizing patient outcomes. Learn about concepts of computer-guided surgeries and therapy. Explore different types of robotic systems and applications.

PROGRAMME CONTENT

Module 3: Image-guided intervention:

Explore the power of computer-assisted diagnostic tools, and learn how artificial intelligence aids in medical imaging, and the early detection of diseases. Explore image guidance in the form of computerized navigation, using either Computed Tomography (CT) or Magnetic Resonance Imaging (MRI) images. Dive deep into advanced imaging technologies, from MRI and CT scans to real-time imaging modalities. Understand how these technologies serve as the foundation for image-guided interventions, providing unparalleled insights into patient anatomy and pathology.

Module 4: Final research project:

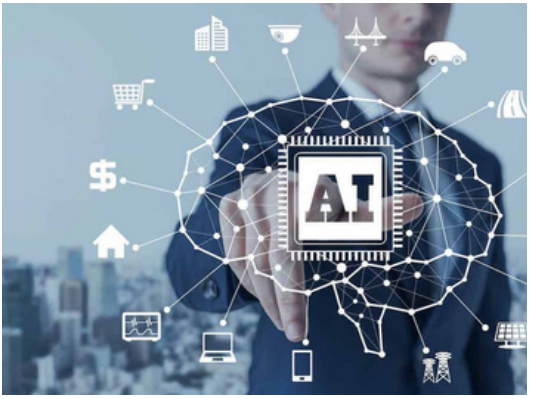
Apply your knowledge gained about medical robots in the final project report. Gain insights into the key components and structure of a research report, including the introduction, discussion, and conclusion. Understand the importance of contextualizing your work within the broader landscape of medical robotics in research. Develop skills in interpreting research results and relating them to the broader context of medical robotics.

PROGRAMME CONTENT

Explore effective strategies for discussing both expected and unexpected outcomes. Understand the importance of proper citation and referencing in maintaining academic integrity.

PART 3: RESEARCHER TRAINING PROGRAMME

This online training dives into the diverse methodologies that underpin successful research endeavors. Artificial intelligence (AI) and Biomedical Science are revolutionising the entire scientific world, changing the way the data is used to make decisions and developing drugs and vaccines. To stay competitive, universities and organizations need skilled researchers with knowledge and understanding of scientific research and who can use research skills and experience.



Through the final research report, you'll gain the essential knowledge and skills required to grow a research career. This unique 4-week online training programme is designed to equip you with the knowledge you need to succeed in your career as a researcher in the biomedical science or AI fields.

PROGRAMME CONTENT

Module 1 - Performing scientific research and research ethics:

Explore the basics of performing scientific research in an international research institute and basic research ethics. Participants delve into the principles of research ethics, addressing issues such as informed consent, data integrity, and transparency. Scientific research demands not only technical skills but also the ability to think critically and solve complex problems. Training programs foster these cognitive skills, empowering participants to navigate challenges and contribute innovative solutions to scientific inquiries.

Module 2 - Writing an abstract and research data presentation skills:

The training delves into the realm of data visualization, guiding

participants in choosing the most effective techniques to represent their findings. Learn about writing a conference abstract, data visualization, and presentation skills. Presentation slides are the canvas for data communication. Training programs focus on effective slide design principles, teaching participants to create visually striking and information-rich presentations.

PROGRAMME CONTENT

From introducing research to presenting research results, learners develop the skills to design slides that enhance presentation skills.

Module 3 - Artificial Intelligence (AI) research skills and literature reviews:

Explore the biomedical science research area or AI applications in medicine (participants can choose their training path during week 3). You will also learn the basics of writing literature reviews. Gain a comprehensive understanding of the scholarly landscape in your field, learning how to identify key contributors, seminal works, and evolving trends. Develop the skills to critically evaluate research studies, synthesize findings, and identify gaps in current knowledge.

Module 4 - Research project:

You will work on an abstract writing project and apply your research knowledge to your task. The research project aims to improve your academic writing, research, critical thinking, and literature reviewing skills. The project offers a roadmap to construct literature reviews that resonate with depth, coherence, and scholarly impact.

PROGRAMME CONTENT

Develop the skills to critically evaluate research studies, synthesize findings, and identify gaps in current knowledge.

PART 4: PROFESSIONAL TRAINING IN HEALTHCARE RESEARCH

This training will equip you with the knowledge and understanding of performing literature reviews in healthcare, developing your research proposal, and writing a literature review. It aims to provide essential knowledge for developing your early research career in the healthcare field.

Module 1 - Literature review:

During the first module of your virtual training, you will gain experience in literature reviewing and finding articles using research databases and search engines. Explore the techniques

of effective introduction, discussion, and conclusion that elevate a research paper to captivating narratives. Gain a comprehensive understanding of the scholarly landscape in your field, learning how to identify key contributors, seminal works, and evolving trends. Develop the skills to critically evaluate research studies, synthesize findings, and identify gaps in current knowledge. Develop strategies for comparing and

PROGRAMME CONTENT

contrasting diverse perspectives and creating a research topic. Uncover the secrets of well-structured research papers, from the formulation of research topics to the summarizing of key information.

Module 2 - Developing a research proposal:

Immerse yourself in the foundational principles of research proposal development, gaining insights into the key components that define a successful research project. Explore the template and methodologies used across disciplines, tailoring your understanding to the unique demands of your field. You will gain knowledge in writing your research proposal. You will develop your research idea in module 2 and learn to develop a research plan for your idea.

Master the art of crafting clear, focused, and impactful research questions that lay the groundwork for your entire proposal. Engage in tasks that guide you through the process of refining and structuring research inquiries that drive meaningful investigations. Explore the significance of reviewing literature and a well-defined conceptual framework in providing the theoretical

PROGRAMME CONTENT

underpinnings of your research. Learn to present your research idea coherently and compellingly.

Module 3 - Healthcare research methodology:

In module 3, you will learn to perform data analysis and statistical analysis in research. You will be given different research tasks to perform data analysis. Engage in practice tasks that reinforce your understanding of statistical fundamentals, ensuring a solid grasp of the analytical toolkit. Navigate the landscape of statistical techniques, learning how to choose the most appropriate methods based on your research questions and data characteristics. Gain practical experience with statistical tools and/or software,

translating theoretical knowledge into actionable skills. You will also learn the types of research methods, ethics involved in conducting healthcare research, preparing interview questions, and developing and filling consent forms.

Module 4 - Healthcare research project:

You will work on a short literature review project and apply your

PROGRAMME CONTENT

knowledge of your area in your research task. The research project aims to improve your academic writing, research, critical thinking, and literature search skills. The project offers a roadmap to construct literature reviews that resonate with depth, coherence, and scholarly impact. Navigate through databases, academic journals, and other resources to compile a rich array of literature relevant to your research. Develop the skills to critically evaluate research studies, synthesize findings, and identify gaps in current knowledge.

PART 5: SCIENCE COMMUNICATION

This course is designed to equip you with the knowledge you need for the practical delivery of science communication. Through the final project report, you'll gain the essential knowledge and skills required to implement science event management and communication strategies. It will provide students with the practical opportunity to apply their learning through the design of a science communication activity. The course aims to empower individuals to be effective conduits between the scientific community and the

PROGRAMME CONTENT

public, fostering a culture where science is accessible, exciting, and meaningful for everyone.

Module 1: Introduction to science communication and communication strategies:

Break free from jargon and discover the art of translating intricate scientific concepts into language that resonates with both experts and non-experts alike. Unleash the power of storytelling to breathe life into scientific facts. Explore the nuances of narrative structure, creating stories that not only inform but also captivate and inspire. Explore the science behind effective communication and adapt your approach to different audiences and platforms. Learn about science communication and effective

engagement. Explore the range of communication and engagement strategies.

Module 2: Science event management:

Uncover the art of harmonizing scientific themes with event dynamics, transforming facts and figures into immersive and memorable experiences. Explore how to infuse creativity into event planning while maintaining

PROGRAMME CONTENT

the integrity of scientific concepts. Master the intricacies of planning and executing science-based events, from intimate workshops to large-scale conferences. Dive into the logistics of venue selection, scheduling, and coordinating guest speakers, ensuring every detail contributes to an unforgettable experience. Learn about event management processes including planning, organizing, and managing conferences.

Module 3: Digital marketing strategies:

Embark on a journey through the diverse realms of digital marketing, from social media landscapes to search engine territories. Dive into the latest trends, unravel the mysteries of algorithms, and understand how to stay ahead in the ever-shifting

digital universe. Master the art of crafting compelling narratives in the digital realm. Explore how to create content that resonates with your audience across various digital platforms. Explore digital marketing strategies and social media marketing.

Module 4: Final Project:

Plan a scientific event in your final project and apply your knowledge of science

PROGRAMME CONTENT

communication. Craft compelling narratives that drive interest and attendance for your science event. Elevate your event with cutting-edge exhibition design concepts. Learn how to create interactive displays that engage participants and convey scientific concepts in a visually compelling manner.

RESEARCH SCIENTIST WORK TRAINING

In today's rapidly evolving scientific landscape, AI is emerging as one of the most powerful tools for advancing healthcare, improving diagnostics, accelerating drug discovery, and transforming patient care. As AI systems grow increasingly sophisticated, the demand for researchers who understand both the technical and biomedical dimensions of this field continues to rise. The 6-Month Research Scientist work provides a unique opportunity for aspiring scientists and early-career professionals to immerse themselves in meaningful, guided research in this frontier area.

This is a **non-paid, voluntary**, and **virtual 6-month position** designed for individuals who wish to gain experience in AI-driven healthcare research while developing critical research skills, engaging in global academic discourse, and receiving personalised mentorship. Through structured tasks, collaborative discussions, and expert guidance, participants will emerge with a stronger foundation in both the scientific and professional practices of health-related AI research

PURPOSE AND VISION OF THE ROLE

The primary goal of this role is to bridge the gap between academic learning and applied research. Participants will actively contribute to research projects in AI in medicine while being supported through a carefully curated learning framework. This role is not merely observational—it is participatory. Participants will apply theoretical knowledge to real-world

RESEARCH SCIENTIST WORK TRAINING

research contexts, gaining a deeper understanding of the practical implications of their studies.
You will explore how AI can be used to address some of the most pressing challenges in medicine today. From identifying biomarkers for disease detection to accelerating the drug discovery pipeline, AI presents a broad spectrum of possibilities, and this research experience places you at the center of it. Through continuous involvement in the research process, participants will acquire skills in scientific inquiry, technical writing, interdisciplinary collaboration, and data interpretation—skills essential for success in academia, industry, or public health sectors.

CORE COMPONENTS OF THE WORK TRAINING

1. Active Participation in Research Projects

As a Research Scientist, you will participate in research activities with a specific focus on AI in healthcare and medicine.
Research themes may include:

- AI-assisted drug discovery and repurposing
- Machine learning models for disease prediction
- Natural language processing for medical records analysis
- Deep learning in diagnostic imaging
- Ethical and explainable AI in clinical decision-making

You will engage in tasks such as, literature reviews, academic writing, and poster presentations. While no advanced experience is required,. Familiarity with basics of research and a foundational understanding of AI concepts

RESEARCH SCIENTIST WORK TRAINING

will be helpful which you will gain through courses during your PD programme. Training resources will be provided to support your learning.

2. Research Writing and Scientific Communication

A distinguishing feature of this role is the opportunity to develop and write a research paper during your time in the programme. Participants will be guided through the process of academic writing, including:

- Structuring a research paper
- Writing literature reviews and abstracts
- Presenting data and analysis clearly
- Referencing and citing correctly
- Revising drafts based on feedback

Each participant will receive constructive feedback, including individualised feedback to improve clarity, coherence, and academic rigor. You will work independently on research writing tasks, which can become part of your academic portfolio or future submissions to journals or conferences.

3. Global Online Research Discussions

You will participate in regular virtual discussion sessions with other volunteer researchers from across the globe. These discussions are essential to fostering a sense of academic community, encouraging dialogue, and enhancing your ability to articulate and defend your ideas.
These discussions are moderated by experienced teachers who help guide discussions and ensure every participant is heard and supported.

RESEARCH SCIENTIST WORK TRAINING

4. Mentorship from Academic and/or Industry Experts

As part of your research training, you will have the opportunity to participate in a live mentorship session led by a senior academic based in the UK and a senior researcher working at the intersection of AI and healthcare. This session offers a rare chance for real-time, personalised guidance from professionals with deep experience in both scientific research and mentorship.
During this session, you will be able to:

- Ask questions about research careers, postgraduate studies, and fellowships
- Receive advice on choosing research areas, applying for PhD programmes, or transitioning into industry
- Gain insights into publishing research, building academic collaborations, and securing funding
- Learn how experts overcame their own challenges and built successful careers in health-related AI

These are not a pre-recorded lectures—They are live, sessions, where your questions shape the conversation. These session are arranged usually after 16:00 pm UK time. All the dates and schedule will be available on our learning platform (Moodle).

LEARNING OBJECTIVES

1. Demonstrate proficiency and apply AI and machine learning methods in healthcare settings.

2. Understand the biomedical and clinical foundations of human health, disease diagnostics, imaging technologies, and patient care pathways.

3. Apply ethical reasoning and critical thinking to AI development, with knowledge of medical ethics and human-centered design.

LEARNING OBJECTIVES

4 Communicate scientific concepts effectively through writing, presentations, infographics, and digital media tailored for different stakeholders, including clinicians, patients, and regulators.

5 Conduct applied research and contribute to academic publications, research proposals, or healthcare product design.

6 Engage with academics and pursue further training or careers in academic or industry research.

CAREER AND RESEARCH OUTCOMES

- Research positions (PhD, MRes.) in health AI or bio-robotics
- Roles in hospitals as AI analysts, digital health consultants, or robotic systems integrators
- Industry positions in med-tech companies, diagnostics firms, or health-focused AI startups
- Public health roles in government, NGOs, or policy think tanks
- Freelance and consulting opportunities in science communication and health journalism

This programme is designed to aid professional development in the field of AI in medicine, enabling you to further your expertise within an existing career path or to change your career direction. Here are several career paths that individuals with expertise in this field may pursue:

- AI Research Scientist/Researcher
- Doctoral/PhD Researcher
- AI consultant
- AI in Healthcare Specialist
- Research Assistant
- Medical Affairs Specialist
- Entrepreneur in AI Startups

DESIGN AND DELIVERY

This online programme is delivered on our internationally recognised virtual learning platform (Moodle). The programme is self-paced and it can be completed on your schedule within programme's duration. The programme includes recorded lectures, templates, learning material, ebooks, and research-based tasks.

It is designed by the CamCID Research Team and Guest Lecturers (faculty members from international universities). Please see further details about our Research Team on our website: camcid.org/groups

DUAL CERTIFICATION

1 After completing (passing) all the parts of this programme, you will be provided with an e-certificate of completion for the Professional Diploma (PD) at the **Cambridge Centre for Innovation and Development (CamCID).**

2 You will receive a separate e-certificate for your **Research Scientist** work at the Cambridge Centre for Innovation and Development (CamCID).

3 You will also receive an additional e-certificate (free of cost) for completing the Professional Diploma by our partner institute, the **Laboratory Skills Development Centre, London**

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