

“AI+X” BLENDED LEARNING

“人工智能+X”融合式学习



前言

“AI+X” 时代到来

Preface: The “AI+X” era is around the corner

“机器人来了，对着人类的工作岗位虎视眈眈。”——人工智能 (AI) 和自动化提高了生产率，也改善着我们的生活，但人类的恐慌却悄然蔓延。据世界经济论坛 (WEF) 最新数据预测，2020年,7500万个传统型工作岗位将被机器所取代。

“The robots are coming – for jobs.” Artificial intelligence (AI) and automation have increased productivity and improved our lives, but the panic has been quietly spread. According to the latest data from the World Economic Forum (WEF), by 2022, 75 million traditional jobs will be replaced by machines

然而，人工智能的到来并不代表人类的工作岗位即将面临枯竭。反之，人工智能的到来将会催生出广泛而庞大的就业机会。2025年，全世界将生出1.33 亿个与AI相关的全新工作岗位。

However, AI will never exhaust human jobs. On the contrary, AI and traditional industries have begun to accelerate their integration in recent years. In 2025, 133 million new jobs will be created in the crossing field of AI, worldwide.

近年来，随着人工智能与传统行业的加速融合，金融、医疗、教育、建筑、交通、艺术、娱乐等传统行业不再单纯依赖传统型劳动力，科技公司更是早已开始深耕人工智能赋能传统行业。具有行业背景，熟悉行业真实场景应用的复合型技术人才、能够将人工智能技术下沉至传统行业场景中的实际操作、为传统行业注入科技血液的新型力量将在这个时代具备最强大的竞争力。

With the accelerated integration of AI and traditional industries, traditional industries such as finance, medical care, education, construction, transportation, art, and entertainment no longer rely solely on traditional labour. Technology companies have already begun to use the applicative AI technologies to empower traditional industries Talents with industry background and familiar with real-world scene applications, talents with capabilities of sinking artificial intelligence technology into traditional industry scenarios and injecting technological blood into the traditional industry will have the most powerful competition in this upcoming era.

“人工智能+X”时代正在到来。

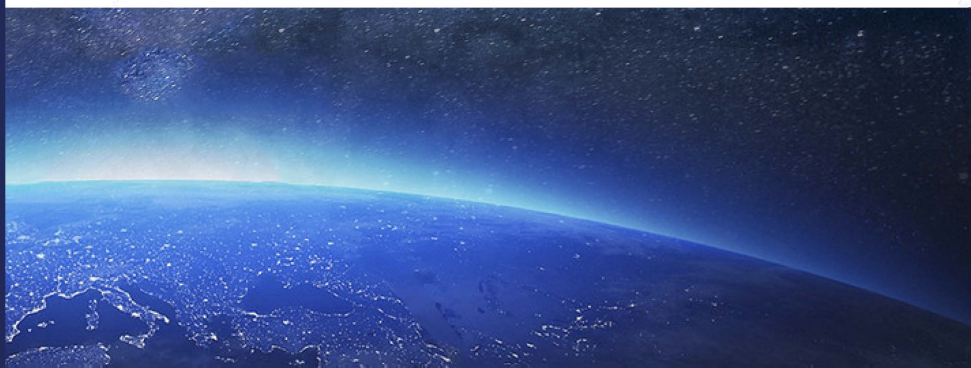
Undoubtedly, the era of "artificial intelligence + X" is coming.

然而，在这伟大的变革下存在着一个冷静而客观的事实：2020年中国人工智能交叉领域人才缺口超过500万，2023年世界范围内的“AI+X ‘人才缺口在将超过千万。

However, there's a calm and objective fact that in 2020, China's artificial intelligence cross-sector talent gap exceeds 5 million and the worldwide "AI + X 'talent gap will exceed 10 million by 2022.

为应对这巨大的变革带来的挑战、迎接伟大时代创造的机遇，我们亟需采取有序而有效的步骤来培养出更多兼具学科知识、工业技能和综合素养的人工智能交叉领域新型劳动力——“AI+X”人才。

In order to cope with the challenges brought about by this huge change and meet the opportunities created by the great era, we urgently need to take orderly and effective steps to educate and generate more "AI + X" talents with knowledge, skills and professionalism.





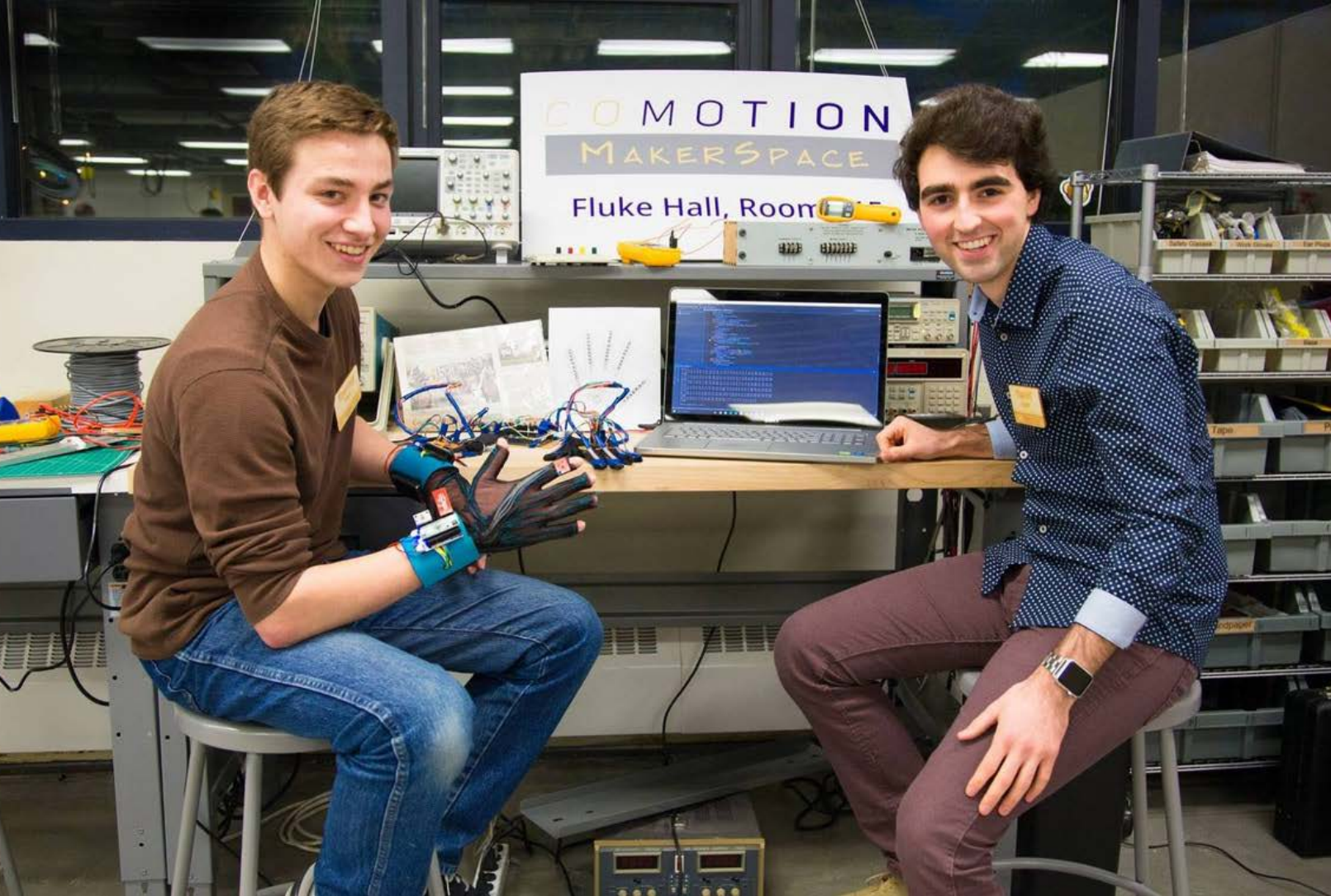
如何成为 “人工智能+X” 人才？

How to become an "artificial intelligence + X" talent?

我们认为，具备以下三种素质的“AI+X”人才将在未来拥有更加强劲竞争力：

Who will be tomorrow's leaders - the one who will guide their groups to the future?

-
- 有能力描绘愿景并设计可行策略，使其自身及所带领的团队永保敏锐度和竞争力
People who shape the vision and strategies that will keep their groups relevant and competitive.
 - 有能力持续创新并具有相应的工程能力，将创新赋予实际
Leaders that can build systems to continuously adapt and deliver innovation.
 - 具有号召力，能吸引具有多样性的团队协同合作并不断寻求下一个突破
People who will engage diverse and distributed teams to collaborate on the next breakthroughs.



“AI+X” 融合式学习

‘AI+X’ Blended Learning

“AI+X” Blended Learning 集合了美国麻省理工学院（Massachusetts Institute of Technology）在人工智能及其交叉学科领域的教学资源，为全世界对AI+X充满兴趣的人才提供了一次相互对话的机会。

"Artificial Intelligence +" Blended Learning ("AI+" Blended Learning) course takes Lecture-based and project-based teaching methods. It concentrates on the AI and related cross-disciplinary subjects teaching methods from MIT, which provide plenty of opportunities for students who are interested in AI across the world.

“AI+X” 即人工智能交叉学科领域，而Blended Learning 即融合式教学方法。

"AI + X" refers to the interdisciplinary field of artificial intelligence. Blended Learning includes multiple learning methods.

“AI+X” Blended Learning 课程旨在将SPOC (Small Private Online Course, 即小规模在线课程)和PBL (Project-based Learning, 即项目制学习)两种教学方法相融合，旨在通过科学研究、项目实践、真实场景应用等课程内容夯实学生在某“AI+X”学科的理论基础、提升学生在真实场景中处理复杂综合问题的工程能力

The "AI + X" Blended Learning combines SPOC (Small Private Online Course) and PBL (Project-based Learning), and aims to walk students through scientific research, project practice and real world applications to consolidate the theoretical foundation of students' in an "AI + X" subject, and enhance students' industrial skills to deal with complex and comprehensive problems in real case scenarios.

“AI+X” Blended Learning

SPOC

小规模在线课程
Small Private Online Course

+

PBL

项目制学习
Project-based Learning

什么是SPOC？

What is SPOC?

SPOC 教学目的

Learning Objectives

SPOC以帮助学生搭建一门“AI+X”学科的理论基础为主要教学目的。

SPOC's main teaching purpose is to help students build the theoretical foundation of an 'AI + X' subject.

SPOC 教学内容

Learning Content

SPOC以教授直播课程及在线课程平台录播课程为主导，在线测试、需要计入成绩的在线作业等在线学习材料为辅助。

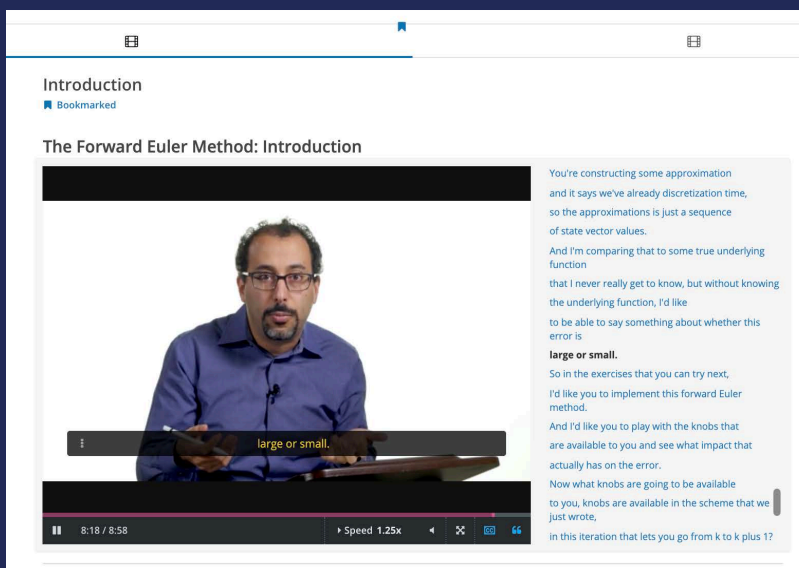
SPOC is dominated by teaching live courses and recording courses on the online course platform, supplemented by online learning materials such as online tests and online assignments that need to be included in the score.

SPOC 答疑机制

SPOC Questions Answering

SPOC 学习过程中，学生若遇任何问题，可于在线课程平台的“讨论板”与教学团队进行实时答疑互动。学生也可在每周单独开放的在线答疑时间与教学团队进行在线交流。

In the process of using and studying the above online recording and broadcasting courses and other online learning materials, if students encounter any problems, they can communicate with professors or teaching assistants during the Office Hour during the SPOC course. At the same time, students can also ask questions to professors or teaching assistants in the live lectures of professors.



SPOC在线学习平台录播视频示例 (Example of a SPOC Recorded Course)

SPOC 在线学习平台

SPOC Online Learning Platform

学生需使用个人电脑或其他移动设备登陆“AI+X” Blended Learning – SPOC 在线课程平台进行课程学习。

Students need to log on to 'AI + X' Blended Learning-SPOC online course platform using a personal computer or other mobile device for course learning.

在线课程平台上所有录制课程均配有滚动字幕、倍速调整等功能，以保证学生对在线教学材料的学习效果。

All recorded courses on the online course platform are equipped with functions such as rolling subtitles and double speed adjustment to ensure students' learning effect on online teaching materials.

学生可直接在课程系统平台上操作完成编程作业，无需使用其他模拟器或编程工具。

Students could directly complete programming assignments on the course system platform without using other simulators or programming tools.

SPOC 课程时间

SPOC Course Length

SPOC课程为期6至8周（视具体课程安排）。具体开课时间请参考课程介绍。学生预计每周需花费6至8小时用于参与直播课程互动、学习在线课程等（视学生个人情况而定）。

The SPOC course is 6 to 8 weeks (depending on the specific course arrangement). Students are expected to spend 6 to 8 hours per week to participate in live-stream course interactions, learn online courses, etc. (the rest of the time depends on the student's personal circumstances).

什么是PBL?

What is PBL?

PBL 教学目的

PBL teaching Objective

PBL以提升学生整体科研能力、技术转化能力、对复杂问题的评估、处理及风控能力为主要教学目的。

The main objective of PBL is to improve students' overall scientific research ability, technical transformation ability, ability to evaluate, handle and risk-manage complex problems.

PBL教学方式

PBL teaching method

PBL以线上小规模授课为或私人授课的形式在线上进行定期直播授课。学生可根据自身情况和兴趣在由授课团队提供的若干个课题方向进行选择，授课团队也会在具体了解学生相关基础后为学生提出选题建议。课题方向确定后学生需根据授课团队制定的教学计划进行课题研究、项目实践及论文写作。

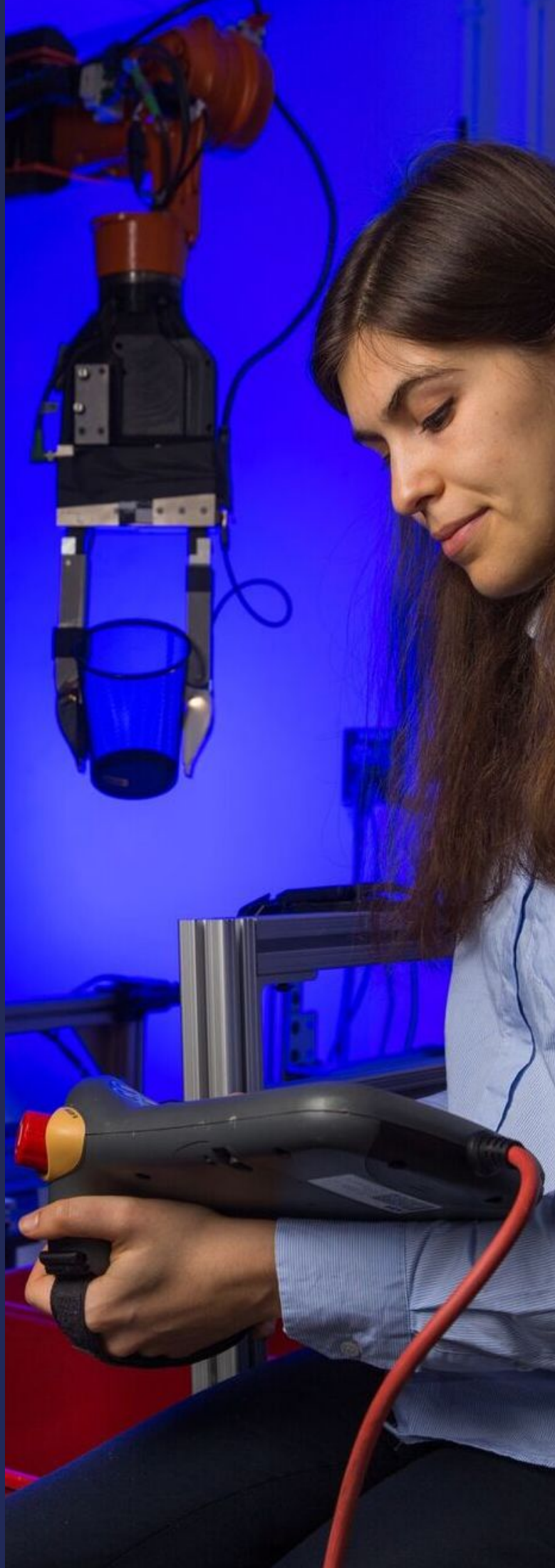
PBL conducts small-scale live online lectures or private live online lectures. According to their own interests, students could choose one out of several project tracks provided by the teaching team. The teaching team will also propose suggestions for students after specifically understanding the relevant basis of the students. After the subject direction is determined, students need to conduct subject research, project practice and thesis writing according to the teaching plan formulated by the teaching team.

PBL 课程时间

PBL Program Period

PBL 课程为期12-14周（视具体课程安排）。学生预计每周需花费6至10小时用于参与线上课程及线下论文写作等（视学生个人情况而定）。

The PBL course is of 12-14 weeks (depending on the specific course arrangement). Students are expected to spend 6 to 10 hours per week to participate in online courses and offline essay writing (depending on students' personal circumstances).



“AI+X” Blended Learning 课程内容所属单位？

Schools and institutions

大学：麻省理工学院

Massachusetts Institute of Technology (MIT)

麻省理工学院致力于生产、传播、保存知识，并不断与他人合作，使这些知识经受得住这个巨大世界的挑战。

The Institute is committed to generating, disseminating, and preserving knowledge, and to working with others to bring this knowledge to bear on the world's great challenges.

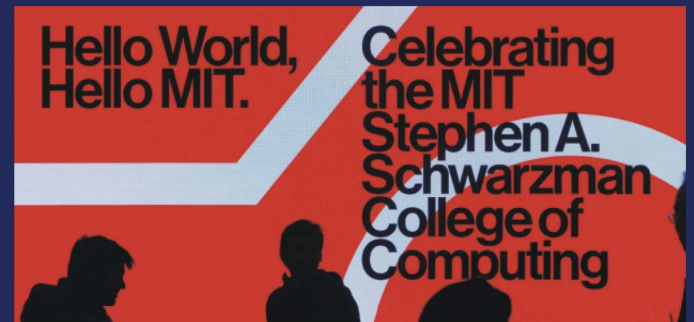
麻省理工学院下共设有：

Five Schools and One College

- 苏世民计算机学院
MIT Schwarzman College of Computing
- 斯隆商学院
Sloan School of Management
- 建筑与规划学院
School of Architecture and Planning
- 工学院
School of Engineering
- 人文社科学院
School of Humanities, Arts, and Social Sciences
- 科学院
School of Science

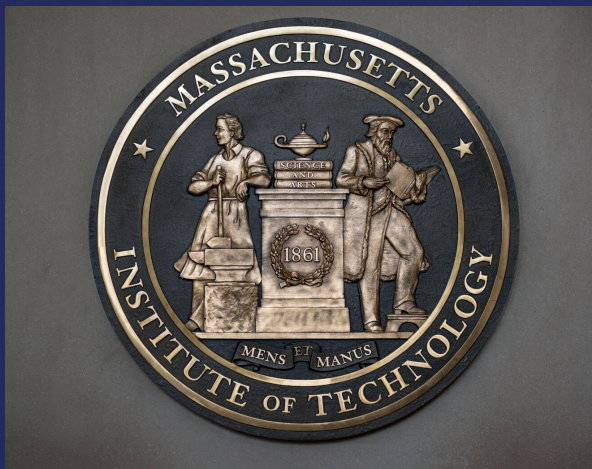
学院：苏世民计算机学院

Stephen A. Schwarzman College of Computing



苏世民计算学院致力打造跨越计算机、人工智能、大数据以及各个应用领域的跨学科研究中心。学院将通过计算和人工智能推动其他学科发展，并通过其他领域的需求和洞见重塑计算和人工智能的未来，以此来应对无处不在的计算与风起云涌的人工智能所带来的全新机遇和挑战。

Schwarzman College of Computing aims to address the opportunities and challenges presented by the ubiquity of computing — across industries and academic disciplines — perhaps most notably illustrated by the rise of AI.



麻省理工学院的座右铭是“思想与手”，即学术知识与实际目的的相融合。

MIT's motto is “mens et manus,” or “mind and hand,” signifying the fusion of academic knowledge with practical purpose.

“AI+X” Blended Learning 课程主题及授课团队

The Courses and Faculties

“AI+X” Blended Learning 授课团队由来自麻省理工学院、哈佛大学或其他在“AI+X”领域美国或英国专业排名前十的海外顶尖高校学院资深研究员、博士后或博士生，以及来自谷歌、亚马逊世界著名人工智能相关企业的高级技术顾问、高级工程师等组成。“AI+X” Blended Learning 授课团队在“人工智能+X方向”学术领域和工业领域均拥有世界顶尖级的实力。

The "AI + X" Blended Learning teaching faculty team is composed of senior researchers, postdocs, or PhDs from MIT, Harvard University or other top overseas colleges and universities in the United States or the United Kingdom in the field of "AI + X". The "AI + X" Blended Learning teaching faculty team also includes senior technical consultants and senior engineers from world-renowned artificial intelligence-related companies such as Google and Amazon.

课程一：

人工智能——通过机器学习来解决问题

No. 1: Artificial Intelligence – Solving Problems with Machine Learning

美国国家工程院院；麻省理工学院电气工程与计算机科学系教授
Member of National Academy of Engineering, Professor with EECS, MIT

麻省理工学院航空航天专业副教授
Associate Professor Of Aeronautics And Astronautics, MIT

麻省理工学院 某实验室主任
Director, Aerospace Computational Design Laboratory, MIT

课程二

“人工智能 + 金融”——金融科技

No. 2 “AI+ Finance” – Financial Intelligence

麻省理工学院 斯隆商学院（Sloan）金融学与管理学教授
Professor, Finance, Management, MIT
美国国家经济研究局研究员
Researcher,, National Bureau of Economic Research

课程三

“人工智能 + 计算材料科学”——多尺度材料设计

No. 3 ‘AI + Materials Science’ – Multiscale Materials Design

麻省理工学院 土木与环境工程系系主任
Department Head, Department of Civil and Environmental Engineering, MIT

麻省理工学院材料科学与工程专业副教授
Assistant Professor Materials Science and Engineering, MIT

课程四

“AI+ 医疗”——机器学习算法在医疗领域的应用

No. 4 ‘AI+ Healthcare’ – Machine Learning for Healthcare Applications

麻省理工学院医学工程首席研究员
Medical Engineering, Principal Investigator, MIT

英国剑桥大学某癌症研究中心主任
Director, Center for Cancer Care, University of Cambridge, United Kingdom

课程五

“AI + 电子工程”——纳米技术

Course No. 5 “AI+ Electrical Engineering” – Nanotechnologies

麻省理工学院 电气工程和计算机助理教授
Assistant Professor of Electrical Engineering and Computer Science, MIT

麻省理工学院 某实验室首席研究员
Principal investigator for two Laboratories, MIT



“AI+X” Blended Learning 课程成果

“AI+X” Blended Learning Outcome

完成 “AI+X” Blended Learning

课程后，学生将：

After completing the PBL, students will have the opportunity to:

掌握一门 “AI+X” 学科的基础理论知识、了解预测、评估实际问题的方法真实应用场景、了解学科领域世界最新应用创新及发展趋势；

Master the basic theoretical knowledge of an "AI + X" subject, understand the real application scenarios of the methods of forecasting and evaluating practical problems, and understand the world's latest application innovations and development trends in the subject field;

获得由麻省理工学院颁发的官方证书；

Obtain an official certificate issued by MIT;

完成至少一篇可发表的科研论文；

Complete at least one scientific paper that can be published.

获得一份课程学习完成度数据分析报告（报告将展示学生对每部分学科知识的掌握程度，可用于学生自我陈述）；

Obtain a course completion analysis report (the report will show the students' knowledge of each subject and can be used for students' self-statement);

有机会获得腾讯、字节跳动、亚马逊云计算等 “人工智能+X” 领域世界顶尖企业的面试机会；

Gain interview opportunities with the world's top companies in the field of "Artificial Intelligence + X" such as Tencent, ByteDance, Amazon Cloud Computing;

有机会获得由授课团队根据学生实际学术情况撰写的推荐信；

Obtain a recommendation letter written by the PBL teaching team according to the actual academic situation of the student.

“AI+X” Blended Learning 课程教学管理

How Does “AI+X” Blended Learning Management Work?

SPOC开课，学生将得到一份由课程教学团队基于课程内容、难度、整体课堂安排制定的“学习进度规划”。学生需按照规划完成每周的课程学习及作业提交。

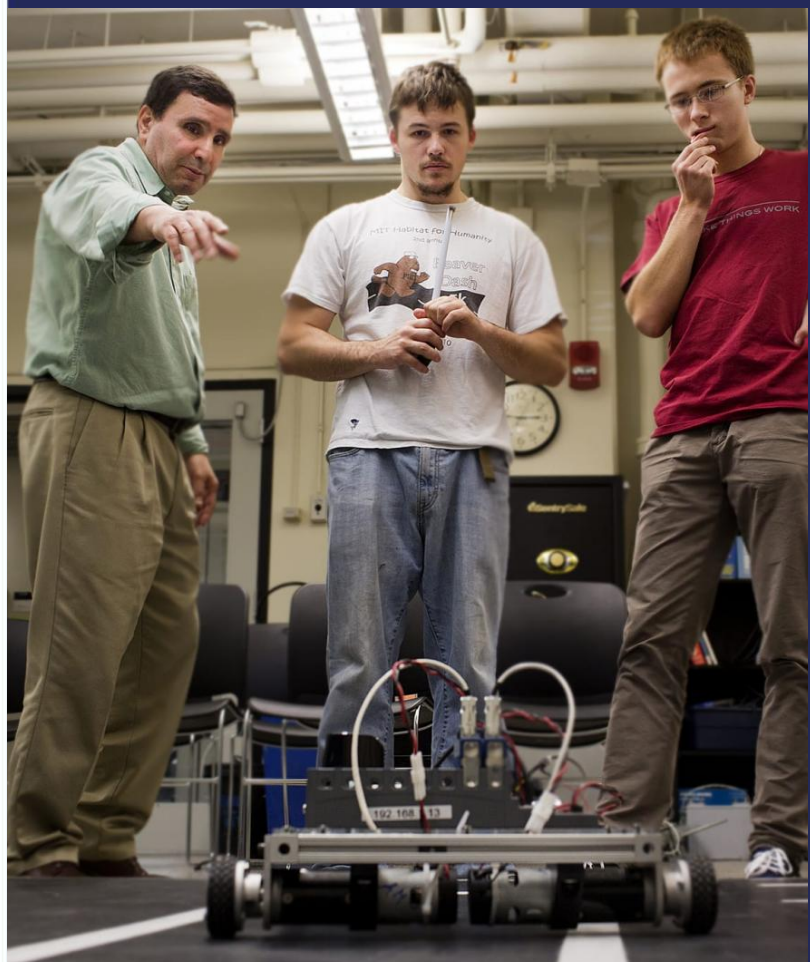
Before the start of the SPOC class, students will receive a 'learning schedule' developed by the course teaching team based on the course content, difficulty, and overall learning progress management. Students are required to complete weekly coursework and homework submission in accordance with the plan.

学生的课程进度和表现将被数据化的呈现在“AI+X” Blended Learning 在线课程平台上，便于学生自行查看学习进度。

The student's course progress and performance will be digitally presented on the 'AI + X' Blended Learning online course platform, making it easy for students to check their learning progress.

由助教和教务管理员组成的“AI+X” Blended Learning 课程后台教务团队将基于该数据对学生进行动态学习管理。

The teaching management team of the 'AI + X' Blended Learning course, composed of teaching assistants and administrative administrators, will conduct dynamic learning management for students based on the data.



“AI+X” Blended Learning 报名与申请

Application Process

1. 'AI + X' Blended Learning 报名条件

'AI + X' Blended Learning Registration Requirements

学术基础: 建议申请者具备一定高等数学（包含线性代数、微积分）基础；

It is recommended that applicants have a certain foundation in advanced mathematics (including linear algebra and calculus);

语言能力: 申请者需在'AI + X' Blended Learning 报名表中提交包含CET中国大学英语四、六级考试、TOEFL、IELTS、普通高等学校招生全国统一考试（高考）英语科目在内的英语能力测试中至少一项测试的成绩。

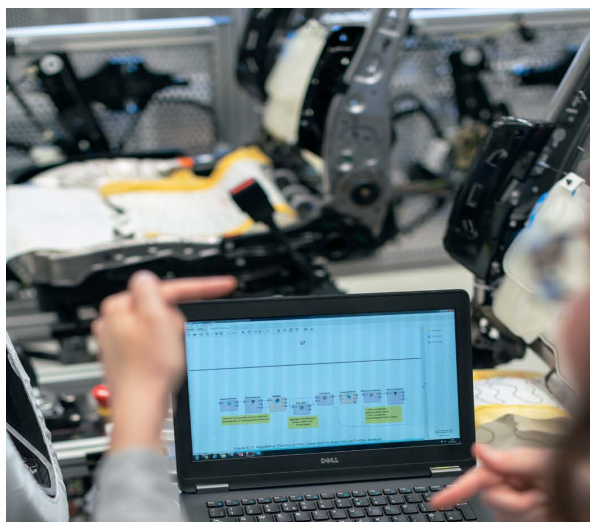
Applicants are required to submit English proficiency tests including CET Chinese University English Test Band 4 and Band 6, TOEFL, IELTS, and National College Entrance Examination (College Examination) English subjects in the 'AI + X' Blended Learning registration form. The score of at least one of the tests.

编程基础: 建议申请者具备一定Python或其他编程语言基础；

Programming foundation: It is recommended that applicants have a certain foundation in Python or other programming languages;

申请者在完成一门“AI+X”SPOC后方可参加该学科的PBL课程。

Applicants must complete an "AI + X" SPOC before participating in the PBL course in this subject.



2. 什么样的申请者适合报名

'AI + X' Blended Learning 课程?

What kind of students are capable of joining 'AI + X' Blended Learning?

- 准备申请AI+X学科方向研究生或博士生的在校学生；

Planned to apply for graduate students or doctoral students in the "AI + X" discipline;

- 正在在AI+X领域寻找工作岗位的在校学生或职场人士；

Job seeking in "AI + X" Fields;;

- 对AI+X 学科感兴趣，希望学习相关知识或技能的任何人；

Anyone who is Interested in learning knowledge and skills in an "AI + X" subject;

3. “AI + X” Blended Learning 报名程序

How do I register 'AI + X' Blended Learning?

申请者需要通过本文结尾处的课程报名链接提交 'AI + X' Blended Learning 课程报名表。

Applicants need to submit the 'AI + X' Blended Learning course registration form through the course registration link at the end of this article.

在申请表提交后的十个工作日内，'AI + X' Blended Learning 课程方将发送录取决定给申请者。

Within 10 business days after the application submission, the 'AI + X' Blended Learning Admission Team will inform the applicant with admission decisions.

一经录取，申请者将得到 'AI + X' Blended Learning 在线学习平台注册邀请。课程开课后学生方可登陆课程在线学习平台开始学习。

Once admitted, applicants will be invited to register for the 'AI + X' Blended Learning online learning platform. After the course starts, students can log in to the course online learning platform to start learning.

“AI+X” Blended Learning 报名与申请

Application Process

如您需要查看“AI+X” Blended Learning 具体课程信息（包括课程大纲、授课团队信息、具体课程成果等），请扫描下方二维码并填写您的联系方式。“AI+X” Blended Learning 课程组将在收到您的信息后将具体课程发送给您。

If you would like to review the detailed information of "AI + X" Blended Learning (including course syllabus, Teaching Faculties, Course Outcome, etc.), please scan the QR code below and fill in your contact information. The "AI + X" Blended Learning Program Team will send out the specific course information to you once received your inquiry.)



"AI+X" Blended Learning 课程大纲申请链接

AI + X Blended Learning Course Syllabus Inquiry Form