第四届全球重大挑战论坛学生竞赛活动参赛说明

由中国工程院、英国皇家工程院和美国国家工程院共同主办的“第四届全球重大挑战论坛（Global Grand Challenges Summit）”将于2019年9月17－18日在英国伦敦召开。论坛将聚焦21世纪人类面临的14项重大工程科技挑战（内容参见http://www.engineeringchallenges.org/challenges.aspx）开展研讨，并激发青年一代投身工程科技事业，通过工程方法应对全球重大挑战。前三届论坛分别于2013、2015和2017年在伦敦、北京和华盛顿召开。

学生竞赛是全球重大挑战论坛的重要活动之一。中美英三国将各选择5支高校竞赛队，于9月13日在伦敦开展应对重大挑战的商业计划创意竞赛。之后，参赛学生还将受邀继续参加9月14－16日的中美英三国混编队现场商业计划创意竞赛活动“协作实验室（Collaboration Lab）”，以及9月17－18日召开的第四届全球重大挑战论坛。

一、竞赛队组队要求及竞赛内容

每所参赛大学限一支学生竞赛队参赛，每支竞赛队的成员包括4－6名本科生（非2019年夏季毕业，即参赛时是在校学生）和至少一位带队老师。学生竞赛队需指定一名队长。队长须是工程类专业的学生，其他成员专业不限，并鼓励其他专业的学生参与。学生竞赛活动工作语言为英文，故要求学生具备较强的英文沟通能力。

每支竞赛队需在赛前选定一项应对重大挑战的项目创意，并制定商业模式和商业计划，于竞赛期间通过英文报告的形式展开角逐（每队在讲台上进行3－5分钟的宣讲），由中美英三国联合评委会评出若干优胜队。优胜队将获得小额现金奖励，并通过媒体进行宣传。

参赛项目创意应立足于本届论坛的主题“不可预知的世界中的工程（Engineering in an Unpredictable World）”，主旨如下：

到2050年，全球人口将增至100亿，地球及其资源也将加速退化，这给人类社会带来了前所未有的挑战。与此同时，巨大的技术变革使得整个世界变得更加智慧、快速和互联，但这也产生了一系列不可预知的后果。

如今，国际社会在努力应对这些快速变化的、不可预知的挑战，而工程师是其中的中坚力量。因此，我们需要将协作、多元化和全球责任感融入我们所建立的解决方案中，从而转变工程师的工作方式、思考方式以及教育方式。

只有现在就开始进行工程技术变革、承担相应责任，工程师才能为2050年的人们创造更美好的世界。

论坛的两个分主题分别是：

（一）人工智能和其他技术革新是否会造福人类？

议题可包括：公平的获取机会、伦理道德、医疗、神经科学、延长寿命、工程教育、自动化、就业、遗传学、机器人、心理健康、意外后果、人工智能的偏见、网络安全等。

（二）我们能否支持 100 亿人口？

议题可包括：食物、水、能源、废物、循环经济、城市化、中国的特大城市、交通、资源、经济发展、虚拟现实、卫生服务、乡村信息化等。

由于主题范围较广，各竞赛队的项目创意可只从一个或若干个角度切入，并不要求涵盖整个主题。例如：

- 如何养活100亿人口？
- 持续城市化是不可避免且可取的吗？
- 如何在全球范围内实现公平的技术获取？
- 如何解决全球水资源短缺？
- 如何实现创新循环？

项目创意的商业计划并不要求是一家成熟的初创企业，而应是一个严谨

的创业设计方案，能够体现出比一个创新的初步想法或技术概念更进了一步。该创意必须具有可行性，具有明确的增长路径，能够带来持续的影响，并不一定是一家盈利机构。

所有竞赛队赛后都将与来自中美英三国的其他学生一同参与随后的“协作实验室”活动和“全球重大挑战论坛”（见下文）。

学生竞赛活动地点：伦敦 South Bank’s County Hall

二、“协作实验室（Collaboration Lab）”活动——2019 年 9 月 13－16 日

届时，约 300 名来自中美英三国的大学本科学生将汇集在英国伦敦开展“协作实验室”活动，即通过开展应对重大挑战的现场项目创意，鼓励他们进行跨文化跨学科的协作，提出应对全球重大挑战的创新工具。此活动学生不需提前做准备。

本活动将于 9 月 13 日上述第一项学生竞赛队比赛结束后启动。所有学生都将重组成新团队，每个团队都由来自三个国家的成员组成。新团队将迎来全新挑战：协作并吸取彼此的技能和经验，取长补短，现场制定应对重大挑战的解决方案。预计其中一些创意将基于上述竞赛优胜队所展示的方案而产生。

为期三天的活动包括：

- 跨文化破冰和团队建设活动
- 基于情景的辅导式研讨会，包括留出时间给新的混编团队提出新方案
- 启发性的报告会
- 由高级工程专家提供的反馈和指导
- 晚间的社交活动，包括伦敦市区参观

“协作实验室”活动最后一天（16 日）上午，各混编团队将在展示会上宣讲自己的新方案，供评委评判。评委将从中选择 4-5 个获胜混编队，在随后召开的全球重大挑战论坛上报告各自的方案。

三、全球重大挑战论坛——2019 年 9 月 17－18 日

“协作实验室”活动结束后，所有参加“协作实验室”的学生都将受邀参加于伦敦举办的“全球重大挑战论坛”。本次论坛将汇集各界领袖以及新一代工程师和变革者，通力创新协作解决未来100亿人口所带来的巨大挑战。

论坛将在伦敦 Southbank Centre 的伊丽莎白女王厅举行。届时中美英三国工程院领导和院士、决策者、研究人员、创新人士、企业家和新一代工程师将齐聚一堂。目前已确认的论坛发言人包括：风险投资家和 MIT 媒体实验室总监伊藤穰一（Joi Ito）、“2050”志愿者、阿里云创始人兼阿里巴巴集团技术委员会主席王坚、西门子英国首席执行官 Juergen Maier 教授、蓝色起源（Blue Origin）前首席执行官 Rob Meyerson、Gapminder 共同创始人及《Factfulness》共同作者 Anna Rosling Rönnlund、哲学和信息伦理学教授兼牛津互联网研究所数字伦理实验室主任 Luciano Floridi 教授等。

作为论坛的一部分，从“协作实验室”中脱颖而出的 4－5 个获胜混编团队将在论坛上作报告。最终获胜团队将通过评委投票和听众投票决出。

英方将负担参赛学生在英参会期间的住宿，其他赴英费用请参赛高校自理。英国论坛主办方将提供参赛人员赴英邀请函，出国手续请自行办理。各高校及其师生参与此项活动属自愿行为，责任自负。建议请参会者行前自行购买适当的旅行保险。

附件：英文参赛说明

GGCS 2019 Student Competition

The Chinese Academy of Engineering, the Royal Academy of Engineering of the UK and the National Academy of Engineering of the USA (The Academies) are inviting university teams to participate in the Global Grand Challenges Summit Competition 2019, a programme of challenge-led innovation, design and business development, culminating in the opportunity for teams to pitch at the final of the competition, attend a Collaboration Lab event, and attend the Global Grand Challenges Summit in London, UK.

Theme

The student competition will be aligned with the main theme of the Summit - 'Engineering in an Unpredictable World':

> *Humanity is facing unprecedented challenges from a population growing to 10 billion by 2050, and accelerating degradation of the planet and its resources. At the same time, exponential technological changes are making the world smarter, faster and more connected, but with unanticipated consequences.*
>
> *Engineers are crucial to the international effort to address these rapidly evolving, unpredictable challenges. We need to embed collaboration, diversity, and global responsibility into the solutions we create, transforming the way engineers work, think, and are taught.*
>
> *Engineers have the power to help make a better world for the citizens of 2050, but only if we transform engineering and embrace that responsibility today.*

Under this, the Summit has two sub-themes, that relate both to the US National Academy of Engineering's 14 grand challenges, and recognise and capture the Sustainable Development Goals:

- **'Will AI and other transformational technologies change humanity for the better?'**
    - Example topics: equitable access, ethics, healthcare, neuroscience, extending life, engineering education, automation, employment, genetics, robotics, mental health, unintended consequences, AI bias, secure cyberspace

- **'Can we sustain 10 billion people?'**
    - Example topics: food, water, energy, waste, circular economy, urbanisation, China's mega-cities, transport, resources, economic development, VR, health provision, digital enablement for rural dwellers

The competition

University teams are invited to propose an innovation or novel approach to address global challenges associated with the sub-themes of the Summit, outlined above.

As the themes are broad, we expect the teams to tackle one or more element of a challenge rather than the entire subject. For example, this could include:

- How do we feed 10 billion?
- Is continued urbanisation inevitable and desirable?
- How can we achieve globally equitable access to technology?
- How do we stop the world being water short?
- How do we make innovation circular?

While this does not need to be a fully-fledged start-up business, we are looking for a rigorous entrepreneurial and design approach which shows that the teams have moved beyond an initial idea or technology concept. The innovation must be viable with a clear route to growth and sustained impact, though does not need to be a profit-making entity.

The Chinese Academy of Engineering will select five champion teams to participate in the final against teams from the UK and the USA, and attend a Collaboration Lab event and the Global Grand Challenges Summit in London, UK, 13-18 September 2019 (see below for more information).

The five champion teams will compete against teams from the UK and the USA, presenting a 3-5-minute pitch of their proposals to a selection of senior judges and all Collaboration Lab event participants.

Winning teams will be awarded a small cash prize, and publicised via appropriate media and social media releases.

All five champion teams will then participate in the Collaboration Lab and Global Grand Challenges Summit, as outlined below, alongside other students from the UK, China, and USA.

Collaboration Lab – 13-16 September 2019

The Collaboration Lab in London, UK, will bring together around 300 students from the UK, USA and China to stimulate and encourage them to work cross-culturally and across disciplines through a programme of challenge-led innovation, providing the tools to respond to global challenges in transformational ways.

The event will be kicked off by the final of the student competition, with pitching presentations from the five champion teams from each country to a panel of senior judges, as outlined above.

All participating students, including competition finalists and other attending students, will then be mixed up to generate new teams of 6-8, with members from each of the three countries. These new mixed teams will be challenged to collaborate and draw on each other's skills and experience to develop solutions to the grand challenges. It is expected that many of these innovations will develop and build on those developed through the student competition.

The programme for the three days will include:

- Cross-cultural icebreakers and team building sessions
- Scenario-based facilitated workshops, including time to develop new proposals in mixed teams
- Inspirational speaker sessions
- Opportunities for feedback and mentoring from senior engineers
- Evening social events, including the opportunity to see and experience London.

On the final morning of the Collaboration Lab, the mixed country teams will present their proposals for judging through a showcase exhibition event. Judges will select 4-5 winning mixed teams to present their proposals at the main Summit (see below).

Global Grand Challenges Summit – 16-18 September 2019

All students attending the Collaboration Lab are invited to attend the Global Grand Challenges Summit in London, following the Collaboration Lab event.

The 2019 Summit is the launch of a second series of summits jointly hosted by the UK, US and Chinese academies of engineering, inspired by the 14 Grand Challenges for Engineering.

The event will convene inspirational world leaders with the next generation of engineers and change makers to build creative collaborations and solve the grand challenges facing our future world of 10 billion people.

The Summit will take place, at the Southbank Centre's wonderful Queen Elizabeth Hall, bringing together the next generation's engineers, researchers, innovators, entrepreneurs, and policymakers with senior professionals and mentors. Confirmed speakers for the 2019 event include:

- Joi Ito, venture capitalist and Director of the MIT Media Lab;
- Jian Wang, the Volunteer of '2050', Founder of Alibaba Cloud, Chairman of Alibaba Group Technology Committee

- Anna RoslingRönnlund, a co-founder of Gapminder and co-author of Factfulness
- Professor Juergen Maier, CEO of Siemens UK
- Rob Meyerson, former CEO of Blue Origin
- Professor Luciano Floridi, Professor of Philosophy and Ethics of Information and Director of the Digital Ethics Lab at the Oxford Internet Institute
- Professor Dame Wendy Hall DBE FREng FRS, Regius Professor of Computer Science at the University of Southampton
- William Tunstall-Pedoe, founder of artificial intelligence company Evi and co-creator of Amazon Alexa and Echo.

The 4-5 winning mixed teams from the Collaboration Lab will pitch as part of the Summit (likely on Wednesday morning). Winning teams will be selected through both judge-led and popular votes.

University team eligibility for student competition

- Each team must comprise between **four and six undergraduate student members** (not graduating before Summer 2019 i.e. must be a current student).
- All teams must designate a team leader who is required to be from an engineering programme, but students from other disciplines are strongly encouraged to be part of the team.
- Each team must have **at least one mentor who is willing to travel to the UK** for the Summit with their team.