

## 自动化学院·智慧讲堂（2026年第8期）

**报告题目：** The Minority Matters:  
Tackling Data Imbalance and Scarcity in  
Deep Learning

**报告人：** 王子栋 院士，布鲁内尔大学

**报告时间：** 2026年6月24日 10:00-11:30

**报告地点：** 学科3号楼N301会议室

**主持人：** 殷利平 教授



**报告摘要：** Deep learning preforms well when data are abundant and well balanced, yet real-world datasets often suffer from severe class imbalance and limited samples, causing models to overlook minority patterns. This talk introduces the challenges arising from such data scarcity and highlights recent advances aimed at empowering minority classes. We will present three state-of-the-art approaches: 1) a contrastive adversarial network for minority class data augmentation; 2) a subdomain alignment augmentation method to reduce distribution shifts; and 3) a prototype assisted contrastive adversarial framework for weak shot learning. Applied to pipeline fault diagnosis, these methods achieve clear performance gains over existing techniques. We will conclude with the importance of “minority matters” in deep learning and directions for future research.

### 报告人简介：

王子栋，现任英国伦敦Brunel University讲席教授，欧洲科学院院士，欧洲科学与艺术院院士，IEEE Fellow，International Journal of Systems Science主编，Neurocomputing主编。多年来从事控制理论、机器学习、生物信息学等方面研究，在SCI刊物上发表国际论文七百余篇。现任或曾任十二种国际刊物的主编、副编辑或编委。曾任旅英华人自动化及计算机协会主席、东华大学国家级领军人才、清华大学国家级专家。

