**报告的题目：**

Deep Convolutional Neural Networks for Raman Spectrum Recognition: A Unified Solution

**报告的摘要：**

Machine learning methods have found many applications in Raman spectroscopy, especially for the identification of chemical species. However, almost all of these methods require non-trivial preprocessing such as baseline correction and/or PCA as an essential step. Here we describe our unified solution for the identification of chemical species in which a convolutional neural network is trained to automatically identify substances according to their Raman spectrum without the need for preprocessing. We evaluated our approach using the RRUFF spectral database, comprising mineral sample data. Superior classification performance is demonstrated compared with other frequently used machine learning algorithms including the popular support vector machine method.

**报告人简介：**

Dr. Jinchao Liu received his Ph.D. in mechanical engineering from the Technical University of Denmark, Kgs. Lyngby, Denmark in 2011, and his B.Sc. degree in automation and M.Sc. degree in control science and engineering from the Wuhan University of Technology, Wuhan, China, in 2004 and 2007, respectively. Since 2012, he has been a principal software engineer and scientist at VisionMetric Ltd, UK. He has published 15+ full papers on robotics, machine vision and machine learning in peer reviewed journals, conference proceedings and book chapters such as IEEE Trans on Industrial Electronics, IEEE Trans on Automation Science and Engineering, IEEE Photonics journal and Analyst published by Royal Society of Chemistry etc. His research interests include machine vision, machine learning, robotics and optimization. As a key member, Dr. Jinchao Liu has been engaged in the development of the world most preferred facial composite software E-FIT6(series) which has been widely used by police forces and law enforcement agencies in the UK and over 30 other countries.  He has also led a number of industrial research projects funded by Innovate UK, including an advanced machine learning project which resulted in a significant advance/breakthrough in vibrational/Raman spectral recognition. His current major projects involve developing novel machine/deep learning techniques for security, healthcare and pharmaceutical applications.