

Machine learning tools for diffraction data analysis

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Diffraction data is usually analysed with a software written using a formal language. Such software is a static object, designed to solve a specific task by following defined rules. It would be more effective if the computer could learn how to perform the data analysis without the need for a formal coding. This is possible by using the various approaches proposed for machine learning. Recently, GPU-based computing has revived the interest in machine learning and the first applications outperforming formal codes appeared. The leading services of voice and image recognition and of language translation, as well as self-driving cars or buses, rely on machine learning and improve their performance leveraging on learning and on experience. In the fields of crystallography and diffraction, artificial intelligence is not exploited yet. We will show here the application of modern machine learning algorithms based on neural networks, to diffraction and related problems.