Science and Technology Facilities Council

CCP-EM

A multi-platform suite of computational tools covering all aspects of cryoEM data processing, from image manipulation to building atomic models.

The Collaborative Computational Project for Electron cryo-Microscopy (CCP-EM) was initiated in 2012 to support the computational needs of the electron cryo-microscopy (cryoEM) community. CCP-EM is mandated to provide user training and developer support and to establish a coherent community for the exchange of best practices and novel ideas.

The CCP-EM software suite is a multi-platform suite of tools that aims to cover all aspects of cryoEM data processing from image manipulation to the building of atomic models, and to cover multiple techniques such as single-particle reconstruction and sub-tomogram averaging.

There are two versions of the software suite. Version 1 was developed between 2012 and 2022. It is still available but is no longer actively developed. CCP-EM version 2, known as Doppio, has been in development since 2022. The CCP-EM software licence covers both versions of the suite.

The software suite was conceived as a generic framework that could support a wide variety of functionalities, and has a modular organisation which can be divided into three layers. The top level is a user-friendly GUI layer. In CCP-EM version 1, this was written in Python using the PyQt toolkit. CCP-EM version 2 has a modern JavaScript GUI that can be viewed in a web browser. Distinct from this is the mid-level management layer, which is written in pure Python. This provides a bridge between the GUI layer and the third layer: the set of functional programs. These programs originate from collaborating developers and are written in a wide variety of languages (including C, C++, Fortran and Python) with distinct control methods and input conventions.

References

Category

Software/CCP-EM

Authors

Tom Burnley
Colin Palmer
Martyn Winn
Matt Iadanza
Joel Greer
Jola Mirecka
Sony Malhotra
Agnel Praveen Joseph
George Coldstream
Rangana Warshamanage
Rob Nicholls

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