Development of Electron Microscopy Analysis and Simulation tools for nanoHUB

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ABSTRACT

Electron microscopy has a crucial role in the field of materials science and structural biology. Although electron microscopy gives lots of important results and findings, some additional simulations and image processing/reconstruction is required to get more information from the data that are collected from the experiments. For this purpose, researchers are using IMOD[1] and QSTEM[2] for electron microscopy analysis and simulation. IMOD is a set of programs used for tomographic reconstruction and 3D visualization and QSTEM is used for quantitative simulations of TEM and STEM images. However, IMOD and QSTEM are hard to install or use for beginners who are not familiar with computational skills. To overcome this issue, we have developed "Online IMOD and STEM tools" to allow users to perform microscopy analysis and simulation with ease. We applied several ways to launch or combine tools. Based on the original source codes of the software, we used the graphical interface builder Rappture to build a new interface to launch several tools. Also, we used the nanowhim window manager to combine and organize tools. The online version of IMOD and QSTEM will enable researchers from all over the world to use IMOD and QSTEM programs directly and easily on the nanoHUB website.

KEYWORDS

Electron microscopy, tool development, IMOD, QSTEM

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