

Nanotechnology simulation and more
Always on, around the globe



Issue 14

Enhance Your Simulation Code With a Graphical User Interface on nanoHUB

Upcoming Events

[Simulating Graphene-Based Photonic and Optoelectronic Devices](#)

IEEE Spectrum and COMSOL will give a free webinar on "Simulating Graphene-Based Photonic and Optoelectronic Devices."

When:

Thursday, June 11th, 2015, 2:00pm EDT

Speakers:

Alexander Kildishev, Associate Professor, Birck Nanotechnology Center, School of Electrical and Computer Engineering, Purdue University.

Andrew Strikwerda, Applications Engineer, COMSOL



Featured Tools



[nanoDDSCAT](#)

Plasmonic metamolecules with unique attributes, simulated using nanoDDSCAT, for use in a 3D plasmon ruler sensor. Figure from: Jain lab at UIUC, published in Nano Lett. 2015, 15, 542-548, Copyright © 2014 American Chemical Society.



[Amorphous Silicon Generator](#)

Generate realistic random-network models of a-Si with periodic boundary conditions.



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[Dr. Xufeng Wang](#), the new Technical Director of NEEDS (Nano-Engineered Electronic Device Simulation Node), has been a nanoHUB member since 2006. Before joining the nanoHUB community, Dr. Wang recalls being an undergraduate student with great interest in nanotechnology and specifically nano transistors. As a participant in Purdue's SURF (Summer Undergraduate Research Fellowship) program working on a nanoHUB-sponsored project, he gained experience creating Graphical User Interface (GUI) designs for simulation codes developed by graduate mentors. Driven by curiosity, Dr. Wang dove deep into nanoHUB and took advantage of the numerous provided resources. By the time he was in graduate school, Dr. Wang was developing his own simulation codes and GUIs.

Since his first experience with nanoHUB as an undergraduate, he has published a collection of 35 resources on nanoHUB including simulation tools, presentation materials, teaching materials, papers, and online presentations. Dr. Wang articulated several reasons that he prefers publishing his resources on nanoHUB.

"The obvious reason is that nanoHUB is the only place to publish your work and reach large numbers of people for free without having to pay for multiple CPUs to run your code."

However, Dr. Wang emphasized that "the most important reason is that nanoHUB provides detailed usage statistics, which is important to the scientist. With nanoHUB, you can figure out who is using your tool, their organization (industry, government, education, etc.), and their geographic location. Everything on nanoHUB is integrated. It offers intuitive user interfaces, meaning you don't have to download anything; it's all on the webpage. This in return increases the scientist's citations and research impact."

So how do you transform your scientific code into a simulation tool on nanoHUB?

nanoHUB encourages the scientist to be both the code developer and the Graphical User Interface designer. It serves as a cloud computational platform for the simulation code, and by using Rappture, a toolkit supporting **Rapid application infrastructure**, the scientist can turn any simulation code into a user-friendly tool with a GUI that can be used by anyone.

"Rappture is very easy to use and understand. So whoever wrote the scientific code can understand and build a user interface in a matter of hours."

Turning your simulation code into a GUI in 5 steps:

1. Log into your account and go to Share & Publish > Simulation Tool.
2. Fill out the provided form with basic information for your tool (tool name, title, version, authors, etc.)
3. A project area will be created for you, which will serve as a storage area. You can design, create, and test your code and user interface in the workspace. The process to design/create your tool interface is made even easier using a collection of pre-defined widgets in Rappture.
4. Once you're done, submit the Rappturized program to nanoHUB for review and installation.
5. Once installed on nanoHUB, test your tool to make sure it functions as desired. If you're satisfied with the tool, you can approve it for publication. If you find any mistakes, correct them, commit the new code back to your project repository, and resubmit your tool for review.

