

nanoHUB Virtual Organization

Content Characterization by Usage, User Feedback, and Community Involvement

Virtual Organizations are institutions whose members are geographically widespread but share a common set of resources and operating conditions. As a virtual cyber-community engaged in theory, modeling and simulation, nanoHUB serves over 115,000 researchers, educators, students and professionals every year. nanoHUB has nearly 700 contributors, and 575 scholarly papers directly cite nanoHUB.org.

As nanoHUB content increases, we find that users are struggling to find the high quality content. As a result, we have continued to improve the search mechanisms on nanoHUB to enable rapid information retrieval. One key element in this effort is to characterize each content item by a variety of criteria that ultimately influence the ranking of the resource. Each simulation tool is characterized by:

- 1) A Google-like ranking based on user reviews and use.
- 2) A target audience rating, or, the expertise level expected from the user.
- 3) An indication if this is an NCN Supported tool, or a community supported tool.
- 4) Data including number of users and simulation jobs, average run time, and average number of stars awarded in reviews.
- 5) Number of citations in the scientific literature—this indicates the vetting of the tool and its use in research.
- 6) Number of questions, indicative of the liveliness of the community. A large number of open questions suggests a poorly supported tool. Conversely, large numbers of closed questions indicates a live code with tool owners interested and dedicated to its support. The introduction of a virtual economy has proved to have a positive influence on the question and answer forum.
- 7) A wishlist enables users to express tool improvement wishes and the tool development team to handle tool improvement processes.
- 8) User reviews: anyone can give a 0- to 5-star review and submit written comments.
- 9) Users can also declare nanoHUB content items as their favorites, which they can later easily find again on their favorite list. Furthermore, they can share their favorite nanoHUB items on six different social network sites, including Facebook, Twitter, and Google.
- 10) A list of associated and recommended documents that support this tool.

NCN also created a new area of nanoHUB.org to manage job applications for the nanotechnology community. Any member can post a resume as part of their profile. Professors and other employers can also post specific job advertisements. Students can browse the ads and apply for particular jobs, either directly on nanoHUB.org or off on the employer's web site.

We created this capability not only to help forge connections within the community, but also to experiment with a new model for sustainability. Many institutions pay significant fees for job advertisements. Posting a single job ad to HPCwire.com, for example, costs \$950. Unlike Google [AdSense](#) or other advertising programs, having job ads would not hurt the scientific integrity of nanoHUB.org, and would be viewed by users as a service to the community.

As part of the jobs component, we developed an order fulfillment system for subscription services. Right now, we are offering a free “basic” subscription for job postings, which allows one job posting per month. We intend to experiment with other subscription models during the coming year. An advanced subscription would support several job postings at once and unlimited access to our resume database for a monthly fee. We may continue to offer the free subscription as a community service for professors who want to advertise a post-doc position or summer internship at no cost. We plan to expand the use of subscription services to many other areas of the nanoHUB.org site as well, so users can pay for additional disk space, faster turn-around time for simulations, etc. We will establish ways for users to pay with the points they earn while working on the site, and also with real dollars.