Tackling humanitarian challenges with citizen cyberscience

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SETI@home: >500,000 CPUs
“Poor man’s Grid”

Folding@home: >1 petaflop

Sony pre Installs folding@home on Playstation-III – user can choose to run in background. 50k PS3s make first distributed petaflop machine (Guiness World Record Sept 2007).
LHC@home: >3000 CPU-years

Fortran program Sixtrack simulates LHC proton beam stability for $10^5$-$10^6$ orbits. Include real magnet parameters, beam-beam effects. Predict stable operation conditions.
BOINC: keep the volunteers happy

Cool screensaver

Message boards = social networking

Credit for processing = massively multiplayer online game
citizen cyberscience:
from volunteer computing
to volunteer thinking
Wim Klein: the first computer at CERN
scientists!
Spot the computers
GalaxyZoo: classify galaxies

If you find something REALLY unusual or strange and it does not look like anything in the how to get started section or in the FAQ, then post it up on the Forum or drop us an email with the reference number.
Herbaria@home: digitize 19th century plant archives
citizen cyberscience for humanitarian challenges in Africa
Africa@home: empower African scientists

Partnership: CERN, Swiss Tropical Institute, Uni. Geneva, World Health Org, 2 NGOs
**Africa@home workshops**: >50 African scientists from 20 countries (South Africa, Mali)
**Africa@home projects**: MalariaControl.net, HIVMM, AfricaMap, Autodock (w. HealthGrid)
**Africa@home servers**: Uni. Cape Town, Uni. Geneva
MalariaControl.net: modeling the spread of the disease

STI population model:
Individuals (humans, mosquitoes) with properties (age, immunity...) and interactions (infect...)
Evolve model, observe results, adjust parameters, repeat to fit field data (deaths, $ spent...)
MalariaControl.net: scientific results

MalariaControl.net: health impact

STI model predictions of cost-effectiveness: Vaccine $1 - $10 per dose with 52% efficacy = $4.73 - $34.43 per fully-immunized child = $450 - $3,500 per death averted = $12 - $96 per disability adjusted life year = $2.7M - $19.8M per year for Mozambique

• STI data reviewed by PATH Malaria Vaccine Initiative with stakeholders in Mozambique.
• Instrumental in Mozambique now planning for possible future use of a malaria vaccine.
Who are the volunteers?

8500 active volunteers and 15,000 hosts in 123 countries, growing at 50 volunteers/day
AfricaMap: cartography from satellite images

BOSSA: open-source software platform for volunteer thinking projects
BOLT: toolkit for web-based training and education
The future: citizen cyberscience by Asian scientists for Asian challenges with worldwide volunteers