Proposal to SDSC: UCI online courses, IU Social Science Gateway & SDSC Portals
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UCI OpenCourseWare Courses
openly licensed by DRW and
Larry Cooperman (and later
others) under Creative Commons
CC-BY SA 3.0 Licenses
Wiley Companion Book
Growing an International
Social Science Network
of Gifted Creative Commons
Moodle Courses, modified
by US Instructors and collaborators

As developed at Indiana Course Links
to Gateway (for Social Sciences;
through Apache Airavata) hosted on a
Moodle platform.
Suresh Marru and IU Colleagues
Complex Social Science Problems
SDSC Trestles Modules (at UCSD)
UCI/SFI working groups
Robert Sinkovits and Doug White
ECSS Request; Adv. Collab. Support

Storage and reuse of results at SDSC

The UCI OpenCourseWare project and Professor emeritus Douglas R. White will
release open courses under a Creative Commons Attribution-Only 3.0 license (CC-BY-
SA 3.0) to instructors and learners around the world. The courses will be available on
the open source Moodle learning management system both as hosted courses and as
course packages that can be installed at other institutions. Courses will also be hosted
at a new Social Science Gateway (built using Apache Airavata open source software)
lead by Suresh Marru, Science Gateways Group, at IU. They will have access to portals
for student assignments and other Social Science analytic problems that are hosted
through the San Diego Supercomputer Center. E.g., (Moodle Cross-Cultural Research,
CCR) and other courses will use successive assignments requiring input of dependent
and independent variables and choice of analytic options that involve missing data
imputation, controls for spatial and phylogenetic autocorrelation, Hausmann tests,
MCMCBayes analysis of type II error in modeling. These programs are in R, and
students can use spatial-phylogenetic software in R at the portal, etc. Many online
diffusible courses of this type provide a very feasible ways to educate new
generations, from high school through graduate school in the easy-to-use high-end
research methodologies that are now available. Each instructor and their university
will make the arrangements with the Science Gateways that can also manage student
usage. White and his co-editors are describing these new resources for instructors in
universities and high schools in our 600 pp Wiley book, A Companion to Cross-
Cultural Research (CCR). The pilot CCR Moodle Course at UCI provides the prototype,
easily developed for many difference topics. Wiley books are noted as having the
highest influence on fields in the Social Sciences like Anthropology. Ours is not a
textbook for students but the handbook for instructors and PhDs in fields using new
methodologies and databases that would otherwise be esoteric but now are very easy
to learn and access through online Creative Commons courses and Gateways. The
multivariate models that researchers and students develop using our databases will
be stored in SDSC archives and configured as networks of potential causal effects for
further study using causal graph analysis à la Judea Pearl.
In August 2012 Professor White’s research team of highly competent graduate researchers and R programs, members of his SFI working group in complex systems and causality, participated in the High Performance Computing (HPC) Summer School at SDSC (UCSD Campus). White met with IU’s Suresh Marru and discussed with him participation in the Indiana University’s Science Gateway efforts for a proposal to create one or more Social Science Gateways that will be accessed from our Creative Commons Moodle and other sites. Involving educational and research institutions that give supercomputer access will give instructors and students NSF-funded access and eventually free access to statistical software resources created by White’s group and others like it. The access systems can also manage student enrollment and their use of computer time on SDSC’s Trestle supercomputer. There is no burden of overhead, then, in principle, on university resources for this aspect of the courses.

Demonstrating the feasibility of the project, White and his three grad students implemented network analysis R code for the cohesive subgroup identification problem (Menger 1927), previously thought to be NP hard (for large graphs) and found that allocation to multiple cores of the GORDON supercomputer improved computation time still further, with linear improvement in runtime scaling with number of cores. For students, use of HPC software means that computational problems more suitable for Trestle (many small jobs) are analyzed in minutes, submitted by course participants but with those live periods of class preserving lots of class time for online discussion of submissions and results and learning of scientific methods and strategies.

Participation will be welcome from University of Illinois faculty.

An ECSS request is made following instructions at - https://www.xsede.org/ecss
Proposal written in collaboration by
1. UCI Professor Douglas White (IMBS) and Director Larry Cooperman (Online Education)
2. IU Principal Research Software Architect, Suresh Marru
3. SDSC Robert Sinkovits