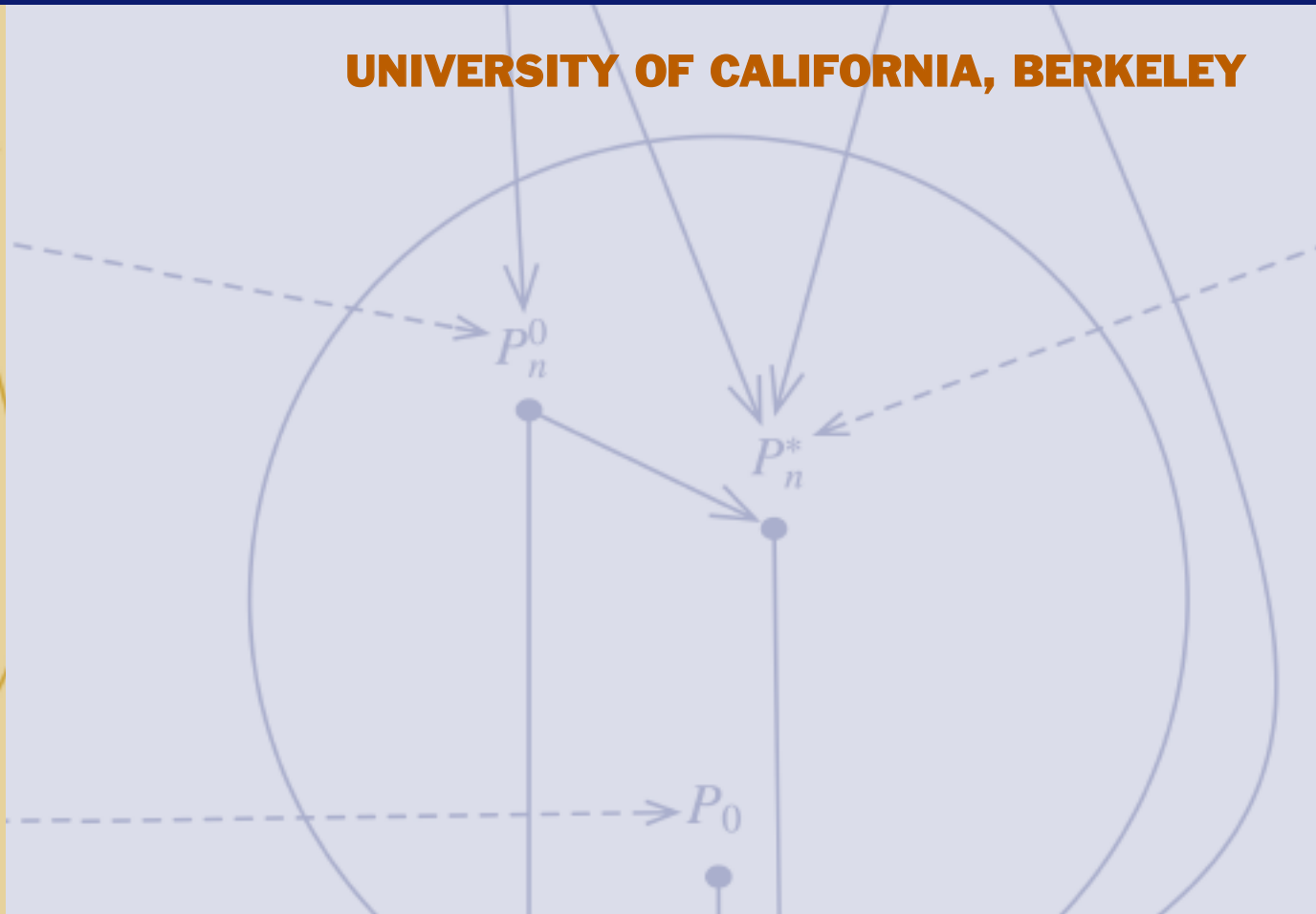
GROUP IN

BIOSTATISTICS

UNIVERSITY OF CALIFORNIA, BERKELEY



PROGRAM OVERVIEW

Many issues in the health, medical, and biological sciences are addressed by collecting and exploring relevant data. The development and application of techniques to better understand such data is the fundamental concern of the Group in Biostatistics at the University of California, Berkeley. Core methodological research interests include loss-based estimation (e.g., classification, regression, density estimation, variable selection), semi-parametric estimation, cross-validation, multiple hypothesis testing, survival analysis, clinical trials, adaptive designs, causal inference, and statistical computing. Areas of application include genetics, molecular biology, epidemiology, and medicine.

The Group in Biostatistics has graduate programs leading to the Master of Arts (MA) and Doctor of Philosophy (PhD) degrees. The curriculum offers training in statistical theory and computer implementation of analytic methods, as well as rigorous opportunities to apply this knowledge in biological and medical research.

Students admitted into the MA and PhD programs come from diverse disciplines including: statistics, computer science, biology, mathematics, chemistry, epidemiology, and physics. The average quantitative GRE score for newly-enrolled students in 2010 was 785/91%. Graduates from the Group in Biostatistics are highly sought after and obtain prestigious positions in academia, industry, and government.

http://www.stat.berkeley.edu/biostat

ADMISSIONS

Candidates appropriate for the MA degree program have completed at least two courses in differential and integral calculus and a course in linear algebra. Applicants for the PhD should possess a strong quantitative background exceeding the minimum requirements for admission to the MA, as well as a previous master's degree in biostatistics or related field. The University requires all students entering a graduate program to have a bachelor's degree and a grade point average of at least 3.0.

All applicants (whether domestic or foreign) must provide three letters of recommendation, a statement of purpose, and GRE scores (general test only). Applicants are encouraged to attend one of the prospective student information sessions offered each Fall by the Group in Biostatistics. These events are listed on the Group's website.

DEGREES

The Group in Biostatistics offers programs leading to both the MA and the PhD degrees. Candidates typically hold degrees in the mathematical and statistical sciences, with a focus in the biological sciences, or hold degrees in the biological sciences, with strong background in mathematics and statistics.

MA Degree

The MA degree in Biostatistics is completed in four semesters. Candidates for this degree are expected to complete 48 units with courses selected from biostatistics, statistics, public health, and biology. At least 12 units must be completed in the 200 series of biostatistics and statistics courses.

Students pursuing an MA degree in Biostatistics will be expected, upon completion of the program, to be well-versed in the following areas:

- Fundamental statistical inference methods, including loss-based estimation (e.g., regression, analysis of variance, and maximum likelihood estimation), hypothesis testing, and survival analysis.
- Algorithms and statistical computing.
- Analysis of categorical and continuous multivariate data with particular emphasis on epidemiology and genomics.
- Causal inference methods for complex data structures, including censored and longitudinal data.
- Computational biology, including genetic mapping, high-throughput microarray and sequencing gene expression studies, and other current topics in genomics.

PhD Degree

A PhD degree in Biostatistics requires a program of courses selected from biostatistics, statistics, and at least one other subject area (such as biology, environmental health, or epidemiology), a qualifying examination, and a dissertation. Courses cover traditional topics as well as recent advances in biostatistics and statistics. Those completing the PhD will have acquired a deep knowledge and understanding of these subject areas. Since graduates with doctorates often assume academic careers in research and teaching, a high degree of mastery in research design, theory, methodology, and execution is expected, as well as the ability to communicate and present concepts in a clear, understandable manner.

The PhD degree program requires 4-6 semesters of course work followed by 2-4 semesters to complete the qualifying examination and dissertation (in total, a minimum of four semesters of registration is required). Since there are no formal course requirements for the PhD, a program of courses appropriate to a student's background and interests may be developed.

All students in the PhD program must hold a master's degree in biostatistics or related field and those applying for PhD study who do not already hold a master's degree are admitted initially for the MA degree. This practice does not prolong the time to conferral of the doctorate, since the first two years of both the MA and PhD programs for students coming from the baccalaureate are identical.

PhD with Designated Emphasis

Students enrolled in the PhD program are eligible to apply for interdisciplinary study in a designated emphasis. A designated emphasis for the PhD degree is the analogue of a minor in baccalaureate programs. The Group, in conjunction with other departments on the Berkeley campus, offers a designated emphasis in computational and genomic biology **(http://qb3.berkeley.edu/ccb/)** and a designated emphasis in computational science and engineering **(http://cse.berkeley.edu/).**

Financial Support

Admitted students are eligible for various types of financial awards, including campus fellowships and support offered by the Group in Biostatistics. Specific funding opportunities include graduate student instructorships, graduate student researcher positions, and block grant fellowships. More information about financial support can be found on the Group's website.

FACULTY

Peter J. Bickel
Non-parametric inference, asymptotic methods

David R. Brillinger
Time series in biology

Chin-Long Chiang
Stochastic processes, life tables

Sandrine Dudoit (Chair)
Loss-based estimation, multiple hypothesis testing, cross-validation, applications of statistics to problems in genetics and molecular biology, such as high-throughput microarray and sequencing gene expression studies

Haiyan Huang
Bioinformatics, distributional approximation

Alan E. Hubbard
Survival analysis, censored and longitudinal data, causal inference

Nicholas P. Jewell
Sampling, survival analysis, HIV/AIDS, epidemiological data analysis, genomics

Michael J. Klass
Approximations, random vectors

Rasmus Nielsen
Population genetic analysis, genomics of natural selection

Maya Petersen
Causal inference in clinical data, dynamic treatment regimes, HIV

Sophia Rabe-Hesketh
Generalized linear mixed models and latent variable models

John Rice
Applied statistics, stochastic problems in neurophysiology

Steve Selvin
Analysis of epidemiologic data, spatial patterns of disease, leukemia

Yun S. Song
Mathematical population genetics, computational biology, bioinformatics, applied probability and statistics

Terence P. Speed
Applied statistics

Michael E. Tarter
Computer and graphical methodology

Mark J. van der Laan
Semi-parametric methods, targeted minimum loss-based estimation, machine learning, causal inference, survival analysis, censored and longitudinal data, computational biology, applications in epidemiology

Warren Winkelstein, Jr.
Ecology, cancer, HIV/AIDS

Bin Yu
Machine learning, classification and unmixing in remote sensing, network tomography, Minimum Description Length (MDL) principle and information theory, computational neuroscience

FURTHER INFORMATION

Visit the Group in Biostatistics
website for more information:
http://www.stat.berkeley.edu/biostat

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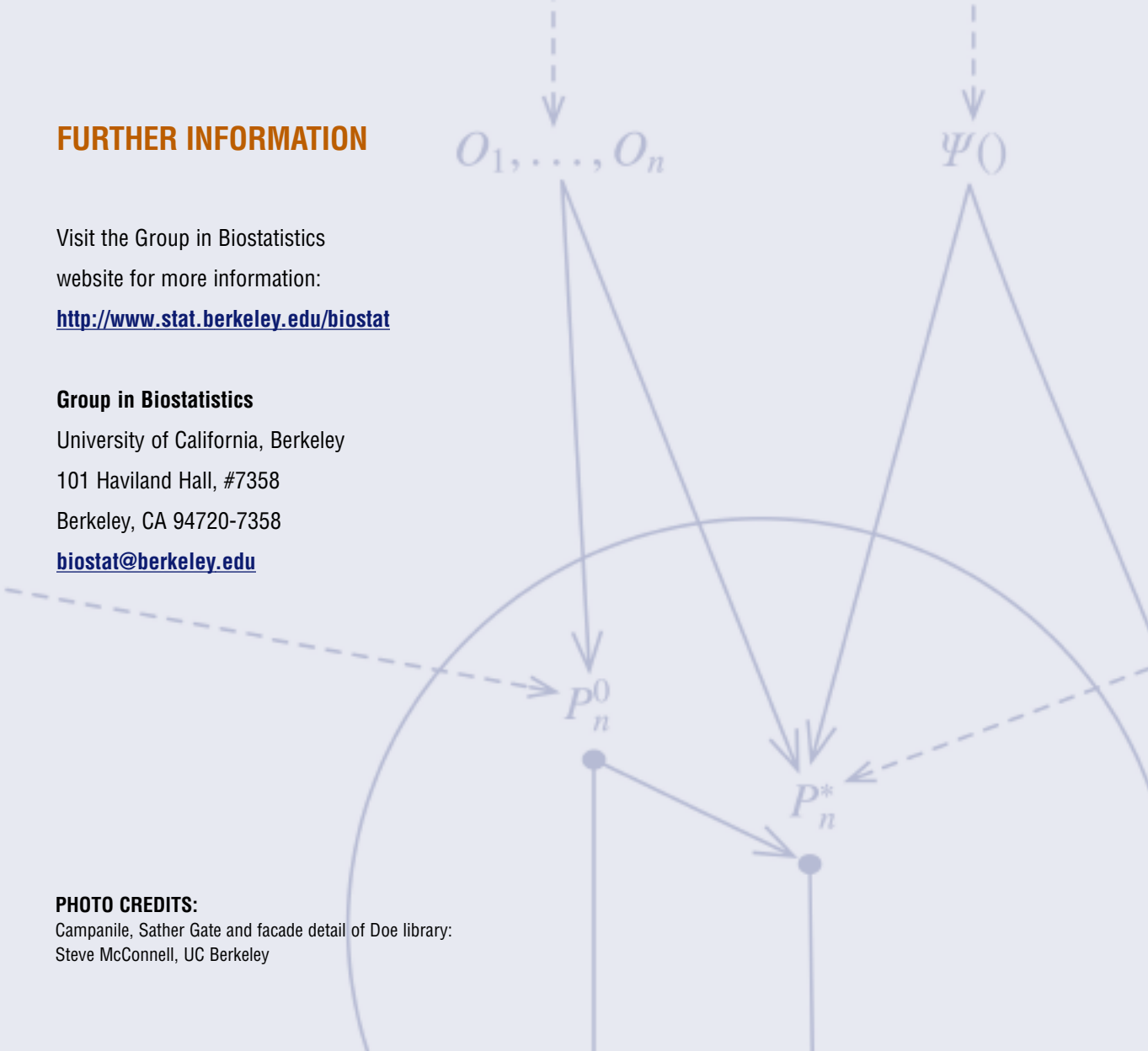

PHOTO CREDITS:
Campanile, Sather Gate and facade detail of Doe library:
Steve McConnell, UC Berkeley