

EARLY CAREER

The Early Career Section offers information and suggestions for graduate students, job seekers, early career academics of all types, and those who mentor them. Angela Gibney serves as the editor of this section assisted by the Early Career Intern Katie Storey. Next month's theme will be in celebration of Women's History Month. All Early Career articles organized by topic are available at <https://www.angelagibney.org/the-ec-by-topic>.



Celebration of Black History Month

The David Harold Blackwell Summer Institute: Goals, Experiences, and Future Plans

Wilfrid Gangbo, Jelani Nelson, and Todd Coleman

Goals

David Harold Blackwell was the first African American elected to the National Academy of Sciences and made seminal contributions to the fields of statistics, economics, probability theory, and information theory. African Americans comprise 4% of PhDs in engineering and 3% of PhDs in mathematics granted from 2010–2020. In 2021, we created a six-week summer institute, named after Blackwell, that aims to increase the number of undergraduate students who aspire to achieve his level of excellence and widen participation of African American men and women in obtaining PhDs in the mathematical sciences.

The David Harold Blackwell Summer Research Institute is led by Professors Wilfrid Gangbo (UCLA Department of Mathematics), Jelani Nelson (UC Berkeley Department of EECS), and Todd Coleman (Stanford Department of Bioengineering), who mentor the students directly. Research topics include, but are not limited to, Optimal Mass Transportation, the Calculus of Variations, Machine Learning, and Theoretical Computer Science. Students are paid to conduct research over the summer. In this process, the students obtain the ability to obtain direct research guidance from a faculty member, to network amongst each other, to receive mentorship from graduate students or postdocs working with the faculty member, to learn

Wilfrid Gangbo is a professor of mathematics at the University of California, Los Angeles. His email address is wgangbo@math.ucla.edu.

Jelani Nelson is a professor of electrical engineering & computer science at the University of California, Berkeley. His email address is minilek@berkeley.edu.

Todd Coleman is a professor of bioengineering at Stanford University. His email address is toddcol@stanford.edu.

For permission to reprint this article, please contact: reprint-permission@ams.org.

DOI: <https://dx.doi.org/10.1090/noti2425>

about manuscript preparation and presentation delivery through their final project reports and presentations, and to learn about applications of these topics from weekly guest presentations.

The long-term goal of this initiative is to increase the number of talented researchers and teachers in the mathematical and computer sciences. With the support of our respective campuses, we aim to ensure that the leading institutions in the state of California increase their participation in training the next generation of students underrepresented in the mathematical sciences. We would like to develop a sense of community where mentees feel welcome in California and an increasing number of mentors receive concrete invitations to participate in changes which transcend group barriers.

Experiences from Summer 2021

The inaugural program took place virtually via Zoom from June 21 to July 30, 2021. Each faculty member advised two students and had weekly meetings with students. In addition, students often met as a group as well as with other graduate students or postdoctoral scholars working with the faculty member. A Slack communication channel was used, in addition to email correspondence, to allow for rapid communication. Dr. Gangbo's students worked on research pertaining to variations of problems pertaining to optimal transportation theory. Dr. Nelson's students worked on research pertaining to theoretical computer science, in particular Fourier sparse leverage score bounds related to approximate kernel learning, and distribution parameter estimation problems when given access to machine learned advice. Dr. Coleman's students worked on research pertaining to quantitative statistical assessment of the electrophysiology and anatomy of the digestive system, using tools from regression and autoregressive statistical modeling. There were discussions over lunch, multiple times each week, where there were opportunities for unscripted and natural dialogue with faculty and students present. In addition, there was a presentation either by one of the undergraduate students or a research presentation from a faculty member outside the institute who works in an area overlapping with one of the faculty mentors. At the concluding meeting, each student gave a presentation on their research accomplishments and wrote a research-style paper. One challenge we found is that six weeks was on the shorter end of an intense research experience. Along with anonymous evaluations, two students were interviewed for the Simons Institute Polylogues on Algorithms and Race, which will soon appear on the Simons Institute channel of YouTube.

Future Plans

We aim to continue this program in summer 2022 for a duration of six weeks or more. Contingent upon the pandemic being more under control, we hope that students

will be housed at the institution of their faculty mentor, thus allowing for more direct mentorship. The final week of the program, when students present, will take place at the Simons Institute at UC Berkeley. This will allow for more face-to-face interaction amongst students working with different faculty mentors and for more direct conversations with one another during the week that concludes with their write-ups and presentations. Students could have applied last year through math programs, for instance by following the link <https://www.mathprograms.org/db/programs/991>.

We encourage anyone with knowledge of a talented student with interests aligned with the program to apply!



Wilfrid Gangbo



Jelani Nelson



Todd Coleman

Credits

Photo of Wilfrid Gangbo is courtesy of Wilfrid Gangbo.

Photo of Jelani Nelson is courtesy of Yaphet Teklu.

Photo of Todd Coleman is courtesy of Todd Coleman.