

BI-CO MATHEMATICS COLLOQUIUM

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“Making Up Minds: Computing and Proof in the Postwar United States”

Monday, April 29, 2019

Talk at 4:00 – Park 338

Tea at 3:30 – Park 361, Math Lounge

Abstract:

Computers ought to produce in the long run some fundamental change in the nature of all mathematical activity.” These words, penned in 1958, capture the motivation behind an early field of computing research called Automated Theorem-Proving or Automated Reasoning. Practitioners of this field sought to program computers to prove mathematical theorems or to assist human users in doing so. Everyone working in the field agreed that computers had the potential to make novel contributions to the production of mathematical knowledge. They disagreed about almost everything else. Automated theorem-proving practitioners subscribed to complicated and conflicting visions of what ought to count and not count as a mathematical proof. There was also disagreement about the character of human mathematical faculties - like intuition, understanding, and reasoning - and how much the computer could be made to possess them, if at all. Different practitioners also subscribed to quite different imaginations of the computer itself, its limitations and possibilities. Automated theorem-proving practitioners built their competing visions of mathematicians, minds, computers, and proof, directly into their theorem-proving programs. Their efforts did indeed precipitate transformations in the character of mathematical activity but in varied and often surprising ways. They crafted new formal and material tools and practices for wielding them that reshaped the work of proof. They also reimagined what “reasoning” itself might be and what logics capture or prescribe it. With a focus on communities based in the United States in the second half of the twentieth century, this talk will introduce different visions of the computer as a mathematical agent, software that was crafted to animate those imaginings, and the novel practices and materialities of mathematical knowledge-making that emerged in tandem.

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