Careers in Classified Research Mathematics

David Saltman

I am a research staff member of, and until recently director of, the Center for Communications Research–Princeton, a unit of the Institute for Defense Analyses. Along with people at the center for Communications Research–La Jolla, and the Center for Computing Sciences–Bowie, we attack problems, usually classified, for the National Security Agency (NSA). Since we work very closely with the NSA, I hope to present some of my thoughts about working in and belonging to the classified NSA research mathematics community. Let me say at the outset that here "mathematics" is understood very broadly. At CCR–Princeton, we have researchers with doctorates in mathematics, computer science, engineering, and more, and I think of them all as mathematicians.

First, the question is whether someone would like to work in our community. To begin with, one must be a US citizen as that is a requirement for the security clearance. The clearance also means it takes more effort to "try us out," since getting a clearance is an involved process. One needs to have a polygraph "interview," fill out a significant amount of paperwork, and then there is a background investigation. Thus there is some "up front" work required before one can learn, in any detail, what we do.

However, let me see if I can state a few impressions of the work without a lot of details. Of course, this is "applied" mathematics but this is more a matter of attitude rather than subject. The work here involves a surprising variety of types of mathematics. Our goal is to provide answers to the people who directly acquire intelligence. If the answer involves deep hard mathematics, we love it. We also love it if the answer is easy but the question is important. We tend to work collaboratively, because we need to use whatever methods are required to succeed. Collaboration gives us the ability to take advantage of the varied talents and knowledge from within the group. We are broadly focused as mathematicians, and have an expansive view of mathematics, because we do what is needed to solve the problem. Sometimes the first challenge is to find the problem. The person or office we try to help has a mission, and we need to find the math problem hidden in their situation, and then solve it.

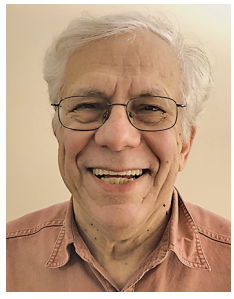
While the above comments make us seem different, I would like to emphasize the similarities between our work and what I prefer to call academic mathematics. Like any research mathematicians, we prove deep theorems and solve hard problems by applying cleverness and novel approaches. As with any mathematics, problems can be impossible. The best researchers have to have the judgment and intuition to choose the "impossible" problem that is actually approachable, or the ridiculously long computer calculation that is just barely in reach, and also, at the same time, have to be important. Of course, the best researchers judge or intuit that some problems will be important in the future, if not necessarily knowing exactly why. While important to us might be a bit different from important to academic mathematics, my experience as director suggests that individuals with a knack for one kind of judgment are usually good at the other.

Like academic researchers, we need to balance our efforts between short-term results and the long-term development of the various fields. Once again finding this balance in academic research is similar to the balance we need to find, and again it seems that being good at one is related to being good at the other.

If the reader of the above finds our work attractive, there are relatively well-established ways to get involved and learn more. The NSA has a number of summer programs for undergraduate and graduate students, and information about them is on the NSA website. The IDA hires academics, both early career and established, for our summer "SCAMP," which is actually three summer research programs, one at each of CCR–Princeton, CCR–La Jolla, and CCS–Bowie. Let me add that we and the NSA want to hire talented individuals who will work in our problem space, not experts focused in a particular area.

Let me strongly urge interested individuals to START EARLY. All these programs require a clearance, and clearances take a really significant amount of time. November is probably too late for the following summer.

Maybe I will see you at SCAMP!



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Credits

Author photo is courtesy of Jennifer Saltman.

David Saltman is a professor emeritus of the Department of Mathematics at the University of Texas at Austin, and is currently a research staff member at the Center for Communications Research–Princeton. His email address is saltman@idaccr.org.

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