

MSCS COLLOQUIUM—MONDAY, FEBRUARY 27, 3:30 PM, RNS 310

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***Still working when the warehouse burns down:
Mathematics of storing data***

As we store more data and rely more on cloud servers, a fear of data corruption or loss becomes more prevalent for more people, companies, and government. In 2021, a warehouse fire in Paris caused millions of websites, government portals, and bank systems to shut down. Just last month, data corruption was blamed for the canceling of over 1000 flights. More regularly, servers need to be taken offline for maintenance. We ask how can data be stored so that we can still access our information despite interruptions like these. One way to solve this problem would be to simply have several servers that have the same exact data. However this method is very inefficient. Another method is to use polynomial interpolation: a degree n polynomial is determined by $n + 1$ points. Specifically, if we have $n + 2$ points, we can lose one and still have enough to recover the polynomial. Now that we have interpolation, we get to be creative about the polynomials and the points. That's where number theory comes in! In this talk, I will provide some examples of the work I have done in selecting just the right points to make recovering lost data possible while trying to be efficient.

