Coding-based Mechanisms for Building Secure Cloud Storage Systems

Challenge:
- Reliability and security features of cloud storage systems are designed independently.
- Identifying appropriate metrics for data availability and security, characterizing fundamental limits based on these models, and constructing schemes that achieve optimal performance.

Solution:
- New perspectives on improving the security of cloud infrastructures
- New techniques for establishing resilience against component failures and node capture attacks
- Increasing the efficacy of coding-based, information-theoretic data confidentiality schemes
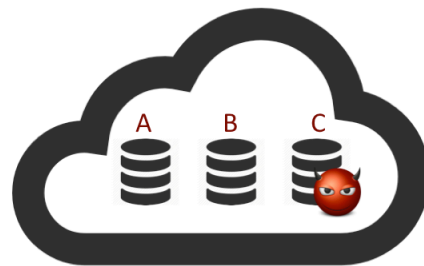
Scientific Impact:
- Revealing the synergy between reliability and security in cloud infrastructures
- Building storage security schemes based on coding theoretic foundations

Broader Impact:
- Ensuring the well-being of critical infrastructures of the nation
  - effective ways of thwarting cyber attacks
  - ensuring data availability
  - establishing trust for storage architectures
- Training students with principles of multiple fields and their interactions