

TP: Implementation of DGHV Fully Homomorphic Encryption Scheme

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1 DGHV Somewhat Homomorphic Encryption Scheme

Implement the basic DGHV encryption scheme [4], with encryption and decryption. You can use the SAGE library [1]. Check that homomorphic addition and multiplication works.

2 Optional: DGHV with Squashed Decryption

Implement DGHV with squashed decryption, as described in [4, 2].

3 Optional: full DGHV

Implement the fully homomorphic DGHV encryption scheme, including the bootstrapping procedure, as described in [4, 3].

References

1. Sage Mathematical Library, Available at <http://www.sagemath.org/>
2. Jean-Sebastien Coron, Avradip Mandal, David Naccache, Mehdi Tibouchi: Fully Homomorphic Encryption over the Integers with Shorter Public Keys. CRYPTO 2011: 487-504.
3. Jean-Sebastien Coron, David Naccache, Mehdi Tibouchi: Public Key Compression and Modulus Switching for Fully Homomorphic Encryption over the Integers. EUROCRYPT 2012: 446-464
4. Marten van Dijk, Craig Gentry, Shai Halevi, Vinod Vaikuntanathan: Fully Homomorphic Encryption over the Integers. EUROCRYPT 2010: 24-43.