Cyclic redundancy check (CRC)

The Cyclic Redundancy check is the most widely used error-detection technique. It allows detecting accidental changes/errors in the communication channel or verifying the integrity of the data stored on your hard drive.

CRC: $R(x) = M(x) \cdot x^n \bmod G(x)$, where $M(x)$ is the original message, n is the degree, $G(x)$ is the divisor, $R(x)$ remainder

Target: GPU, CUDA implementation

Challenges: parallel algorithm design, low-level optimizations

Real-world applications: 5G, Data integrity of large-scale cosmological simulation