Assignment 0  
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Biography  

Originally from Naples, Italy, I am in my last year currently completing a Computer Science and Pure Math Bachelor. In my time in Berkeley I have gotten intrigued by the entrepreneurial activity in Silicon Valley, and I am currently pursuing a venture that I have just co-founded this year. I have been an avid learner and admirer of math from an early age and just recently been engrossed by Computer Science and its possibilities. I want to gain a deeper understanding of how computer programs work on a low level on modern hardware so that I can efficiently exploit today’s and tomorrow’s available resources. 

Regarding my interest, I have been following loosely the BitCoin protocol for about a year and started getting into details of different crypto currency protocols in the last month. I believe that the adoption rate of crypto currencies is growing and they might eventually substitute our current physical currencies and revolutionise the banking industry.

Parallel Application: PrimeCoin Mining  

Background  

PrimeCoin is a peer-to-peer open source crypto-currency that shares many of the technical implementations of BitCoin and was created in July 2013. Crypto currencies need to artificially make it computationally costly for network users to validate transactions and reward them for their work to avoid users to perform fraudulent activity, such as trying to validate two transactions in which a user is trying to spend the same coin twice. The idea for solving this problem is known as proof-of-work. PrimeCoin is the first crypto currency that implements a scientific computing proof-of-work. The computational puzzle involves finding rare chains of primes of the following three types: Cunningham chain of the first kind, Cunningham chain of the second kind, or a bi-twin chain. In the case of the adoption of a currency such as PrimeCoin is fundamental that the community is aware of the most efficient way of mining so that you can reduce the risk of significant outliers with fraudulent intentions.

Opportunity  

Current PrimeCoin Miners utilise distributed networks of multicore CPUs. There are currently no miners that exploit GPU, which turn out to be very useful for prime number sieving. A GPU miner working on a distributed network could significantly outperform the current approach.

Reference  