Optical Box for Optical Computing

# Brief

Optical Box operated under control of embedded computer for Optical Computing like Fourier Transform by a Lens or 2D Fourier Transform. Calculation price (or energy power per single math operation) of Optical Box is 5-10% or less of Discrete Processor calculation price. Optical Computing is not a universal panacea of Computing Industry. It has many limitations, need special knowledge, and need additional research in math, optics and algorithms.

# Owner

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1992 Diploma of Engineer of Applied Mathematics

1999 Diploma of Economics (Financial Management)

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# Description

Optical Computing is not a modern idea and technology. Optical Computing idea was popular in 1980-1990. There are many publications and research exists, but until now, no one device sold for public.

Major technics used for Optical Computing is Fourier Transform by a Lens or 2D Fourier Transform.

During previous century electronic components was expensive, other components was unique and do not provide required quality to make product for everyone. Therefore, technology has been concentrated to manufactory Discrete Processors based on logic of switchers and transistors.

My own research and analysis of price and characteristics of electronic components presented on consumer market (beginning of 2015), show that Optical Box for Optical Computing operated under control of embedded computer can manufactured with follow properties:

1. Dimension of single Optical Box for Optical Computing do not exceed the dimension of modern Discrete Processor with cooling radiators.
2. Computing effectivity of Optical Box for Optical Computing (for special calculations) are compatible to computing effectivity of modern Discrete Processor of same size.
3. Manufacturing price of Optical Box for Optical Computing is chipper than manufacturing price of modern Discrete Processor and do not required so expensive equipment and buildings.
4. Calculation price (or energy power per single math operation) of Optical Box is 5-10% or less of Discrete Processor calculation price. Therefore, Optical Box do not required additional cooling system like modern Discrete Processor.

Analysis of trends show me that single Optical Box for Optical Computing with a size like the size of modern Discrete Processor with cooling radiators will have the bigger computing effectivity and smaller calculation price (or energy power per single math operation) then the same size Discrete Processor.

Optical Computing is not a universal panacea of Computing Industry. It has many limitations, need special knowledge, and need additional research in math, optics and algorithms. **Using Optical Computing a lot of money and energy, spend to calculation will be saved.**

Optical Computing can used in many areas of data and signal processing:

1. Video and Audio Processing.
2. Patterns Recognitions.
3. Trends Analysis.
4. Network Data Transmission.
5. Cryptography.
6. Scientific Calculations.

Who can use Optical Computing?

1. Banks and Brokerages to predict stock trends.
2. Medical Laboratory to analyze microscope images.
3. 3D and 2D Designers to render images of scene.
4. Sound Recorders to remove noise or detect voice.
5. And more, more and more

I intend to manufactory Optical Box for Optical Computing as 19’’ rack-mount case with an embedded control system and network interfaces. This manufacturing schema allow using Optical Box for Optical Computing as a Personal Device or as a Mainframe Part.

The Optical Box for Optical Computing will operate with other application and tools using web-based API (Application Program Interface) like REST, SOAP or similar. Plugins and Add-ons will be developed for the most popular applications like Adobe Photoshop, Solidworks, 3D Max, Ninjatrader, etc.

A roadmap for this project required 1 year for R&D, Market Analysis, Negotiations, Patents and Legal.

R&D include Optical Box design and Optical Box Emulator development. Optical Box Emulator will allow test and demonstrate functionality to customers and investors without full Optical Box manufacturing process. Optical Box design required Component Supplier Analysis to be first.

# Economics

Average mainframe electric bill can exceed 100K/month and number of mainframes worldwide are hundreds. Big part of this money are spend to energy power for typical calculations that can be done with Optical Computing with price 90-95% or more less as usually. Take part of money saved is a main market for this project.

For example,

Let 100 mainframes have average electric bill can 100K$/month and using Optical Computing cut electric bill to 50%. If 10% of saved money will be spend to Optical Computing maintenance then 100\*100K$/month\*50%\*10% = 500K$/month is income can be received as subscription plan for Optical Computing.

Optical Box for Optical Computing sales, third-party software licensing and consulting will generate additional money income.

# Usage Samples

To show how Optical Computing with 2D Fourier Transform can be used I develop some examples of image processing tools with 2D Discrete Fast Fourier Transform which is closed analogy of 2D Infinity Fourier Transform by Lens - Image Resize, Image Blur, Image Pattern Detection.





