CASE STUDY

MemComputing provides a solution that not only increases the speed and accuracy of our calculations, but also allows us to look at large amounts of data from multiple perspectives. When it comes to big data analysis, sometimes you don't know how to approach the data. We are looking for different hypotheses from the data. So data scientists like me explore this using various techniques. But, the size of the data limits the type of explorations we can conduct. MemComputing's engine removes this limitation since it is so fast. One can explore and learn about the data which leads to optimal solutions for our own applications.

– Peter Shin, CEO/Canvass Labs

MemComputing Inc.

Canvass Labs is automating code audits so companies can accurately identify the open source code within their products. In transforming this manual and time-consuming process to a rapid and systematic approach, Canvass Labs found their need for computational optimization far outstripped today's hardware capabilities. By adding MemComputing's software solution, they were able to reduce computation time from hours to seconds and produce more accurate results.

CHALLENGES:

- Need to search for hundreds of code possibilities within hundreds of millions of lines of code.
- Research needs to identify the best algorithms for matching code product.
- Accuracy and comprehensiveness of results translates to millions of dollars for target customers.

BENEFITS:

- Dramatic reduction in processing time.
- Ability to scale from hundreds to hundreds of thousands of search results.
- Higher accuracy of results of computations.
- Ability to improve algorithms by performing more experiments and research trials.
- Improved data collection and post processing analysis.
- Resolution of complex computational optimization products.

Canvass Labs is creating a software product to solve one of the most time-consuming and painful processes for large software developers: identifying and accounting for all of the open source code that is integrated into their products. Open source code is widely used to save time and optimize software development; however, it carries with it a variety of legal, security, and financial implications.

Open source code in software products

Software companies spend hundreds of thousands of dollars in engineering time going through code manually to figure out what parts of their code are taken from open source, and what licensing agreements they are subject to based on that code.

Determining the legal implications of every bit of code is fundamental to making sure companies comply with the law, to ensure the code is secure, and to know the value of their intellectual property.

The dangers of Open Source were exemplified in the Equifax breach, caused by open source code Equifax used to build their website. Another well-publicized story is that of the Linksys purchase by Cisco. After the purchase, the Linksys code was analyzed and found to be subject to the GPL open source license, meaning that it was not proprietary and could not be owned by a private entity. Cisco did not fully get what they paid for, but they found that out only after spending $500,000,000.

It's a bit of a cliché to mention, but it's true. Today, companies lose money and reputation because of inaccurate open source auditing, but tomorrow, if that open source code is in your life support system or pacemaker, and someone can hack it, it's a life or death situation.

- Peter Shin, CEO/Canvass Labs

Automating code audits

Canvass Labs recognized that code audits could be automated and has been developing a solution for large and mid-sized software companies to analyze their source code through an on-premises software solution. However, it was taking Canvass Labs a tremendous amount of computing power and time to analyze the code. With only 1008 open source packages, it was taking 5-10 minutes to get meaningful results on the source code. While this was acceptable, the goal is to reach a library of hundreds of thousands of open source packages. Scaling to that level requires exponential increases in compute power, which simply would be impractical at those speeds.

MemComputing reduced that 10-minute compute time to milliseconds.

"Scaling of the solution is a requirement," said Peter Shin, CEO of Canvass Labs. "A partial audit leaves software companies in the same place: needing to manually scan for open source. The computing power provided by MemComputing is one of the important keys for our software to work in a timeframe that is viable for regular, ongoing auditing."

ABOUT CANVASS LABS

Canvass Labs is group of computer scientists and data analysts who aim to automate and assist in streamlining the Open Source Software (OSS) review process used by legal, business, and engineering teams at companies that employ OSS in their source code across their organization. The Canvass Labs core products utilize big data, machine learning and AI concepts that can intelligently identify and understand software packages much in the same manner that humans OSS reviewers can.

ABOUT MEMCOMPUTING, INC.

MemComputing, Inc.'s disruptive coprocessor technology is accelerating the time to find feasible solutions to the most challenging operations research problems in all industries. Using physics principles, this novel software architecture is based on the logic and reasoning functions of the human brain. MemComputing enables companies to analyze huge amounts of data and make informed decisions quickly, bringing efficiencies to areas of operations research such as Big Data analytics, scheduling of resources, routing of vehicles, network and cellular traffic, genetic assembly and sequencing, portfolio optimization, drug discovery and oil and gas exploration. For more information about MemComputing, visit http://www.memcpu.com/.

> *Our goal is to provide an accurate solution based on the hundreds of thousands of open source projects out there today. This is a hugely complex computational optimization problem, and today's chipsets aren't optimized to handle this. With the right computational layer through MemComputing, we are getting dramatically faster and more accurate results.*
>
> *- Peter Shin, CEO/Canvass Labs*

BENEFITS OF USING MEMCOMPUTING

For Canvass Labs, the MemComputing system provided several key benefits:

- Dramatic reduction in computing time and power needed for processing large optimization algorithms.
- Increased accuracy in identifying open source software within the code base that was analyzed.
- Ability to do deeper research, due to the speed and accuracy of the program.
- Personal touch working with researchers in MemComputing who helped formulate algorithms.

"Analysis of big data often requires slicing and dicing the data from various angles." said Shin. The problem faced by Canvass Labs is common to many big data companies. In order to extract value from the big data, it often needs to go through various computations—preprocessing steps. Analysts need to try different mathematical approaches. If the computation time is faster, it dramatically increases the researchers' ability to try a variety of different approaches. The result is a better optimization algorithm, as well as a faster one.

"MemComputing has a good technical team and were available to handle all of our concerns. They have a collaborative approach, and they speak our language," said Shin.