DISRUPTING CANCER

Lunit develops a deep-learning AI to speed global cancer diagnostics

An AI lifeline

“Do I, or don’t I?” The question keeps people awake at night in the early stages of a cancer diagnosis. Too often, the diagnostic process can leave patients with more questions than answers.

Hannah (not her real name) had a chest pain. It was troublesome enough for her to take action. So, she scheduled an appointment at her local hospital where her physician ordered an x-ray. “The image was read as negative,” recalls Minhong Jang, co-founder and Chief Business Officer of Lunit. But it did little to put Hannah’s mind at ease. The pain persisted. The worry grew. A follow-up appointment was scheduled. Time passed.

Finally, the day arrived. This time, her doctor was ready with a different approach. Instead of ordering new imagery, the physician uploaded the existing x-ray into a new software tool, where an artificial intelligence (AI) algorithm would scan it for evidence of disease.

Seconds later, the result came back, and her doctor confirmed the result. Hannah had early-stage lung cancer. At last, she could begin moving forward with her treatment and her life. Thanks to AI, the doctor was able to see what he missed the first time.

And it was made possible by a small South Korean startup company, Lunit, whose approach to AI is as unique as its origin.

INDUSTRY: HEALTHCARE
REGION: SOUTH KOREA
VISION
Build an AI based on deep learning to deliver higher accuracy and faster cancer diagnosis that saves lives

STRATEGY
Scale quickly with a partner that delivers global support and a secure, reliable platform

OUTCOMES
• Processes millions of medical images from 80 countries through Lunit’s AI algorithm
• Speeds time to cancer treatments by delivering accurate diagnostic confirmation (minutes vs. weeks)
• Delivers 97% accuracy diagnosing cancer and other diseases
Lunit is a young company with a new idea disrupting the world of cancer diagnostics in just a few short years. The team’s first product was about as far from the world of medical diagnostics as it could possibly be. But buried in that product’s backstory were ideas that enabled Lunit to build an AI that succeeds where others fail.

**Deep learning to the rescue**

Data-driven medicine was supposed to make our lives better, longer. So why do 10 million people around the world still die of cancer each year? The statistics about new cancer cases don’t look good, either. According to the World Health Organization, another 18.1 million will be diagnosed with the disease every year. It means roughly one of every 10 people will eventually die of cancer.

If ever there was an industry segment that could benefit from AI, it’s cancer diagnostics. Existing diagnostic practices often leave patients with unclear results and raise more questions than they answer. “In the world of mammography, it’s easy for doctors to miss cancer,” Jang explains. “In fact, 30% of patients initially receive an inconclusive diagnosis after their first mammogram.”

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The team at Lunit wanted to make a difference. So they set out to build a better AI.

“When we were looking at competing products on the market, most were based on traditional machine learning,” Jang says. “But that approach generates too many false positives. We knew if we were going to enter the cancer diagnostic market, we had to do something different than everyone else.”

To achieve the levels of accuracy that would distinguish their product in the field, Lunit built their solution on deep learning—a subset of machine learning. The higher levels of accuracy mean definitive answers for patients, but they also lead to less disruption and worry, regardless of the diagnosis.

**Where it all started: beats, rhymes, and fashion technology**

Before they were saving lives, the Lunit team met at KAIST research university in South Korea. The cofounders were all big music fans, so they started up a study group in a local hip-hop club. The group did get some studying done, but they had other, more pressing topics to fill their weekly conversations. And eventually, the group bonded over something other than their love of beats and rhymes—a shared lack of fashion sense.

“We were all nerds who didn’t know how to dress,” Jang laughs. “I mean, look at us.”

Together, they came up with the idea to build an app that would help other fashion-challenged individuals like them. “We thought what if we could develop an app to recognize and identify designer fashions in social media photos?” Jang recalls.

The team ran with it, building what they still think may have been the world’s first clothing-recognition technology. But after testing it and shopping it around Silicon Valley, the team couldn’t find anyone interested enough to license or buy the tech.

That’s when a friend set them on a course that would change their lives.

“A medical student at the university said to us: ‘Hey, you guys are all smart PhD candidates, why don’t you take that tech you developed and apply it to medical imagery? Instead of using technology to buy better clothes, you could be helping doctors make better decisions.’”

After inviting a medical doctor to join the team—Brandon Suh, who now serves as their CEO—Jang and friends took their friend’s advice and Lunit was born.
A strategic partnership for a global solution

It’s no wonder Lunit’s founders felt a sense of urgency to get their message, and their technology, into the wider world. But they would need a helping hand. Already gaining the attention of academics, regional diagnosticians, and medical universities, Lunit needed to scale quickly.

That meant packaging its solutions into a repeatable platform to reach potential users wherever they happen to be. Through a local technology partner, DKUNC, Lunit was introduced to the HPE Korea team. “We were looking for a hardware platform that would give both our developers and our customers a high level of reliability,” Jang recalls. “We have high confidence in HPE as a worldwide technology partner—both their hardware and their support services.”

The ability to scale and support

Lunit decided to team up with HPE as part of its OEM program and now delivers a Lunit-branded appliance solution to its customers.

Lunit INSIGHT algorithm runs on an HPE ProLiant DL360 or DL380 Gen10 Server while an HPE ProLiant Gen10 MicroServer de-identifies sensitive patient data prior to processing and re-identifies it before sending the images on to hospital image archiving systems.

Together with HPE, Lunit’s small team gains a worldwide distribution, support, and marketing presence. “Now Lunit has a strong position when working with hospitals,” Jang explains. “Having an extended 5-year product warranty is very beneficial. With global technical support from HPE Pointnext, our customers have more confidence working with Lunit knowing we can provide service through HPE anywhere in the world.”

Empowering physicians, saving lives

Today, Lunit technology is being used in more than 80 countries and more than 1.7 million images have been analyzed by Lunit’s INSIGHT algorithm. In the process, Lunit is transforming the practices of physicians, clinicians, and diagnosticians while delivering lifesaving services and accurate information to patients.

Now with more than 30 deep-learning experts on staff, the young team has already surpassed efforts from industry titans with household brand name recognition. “Our accuracy is setting a new standard for cancer diagnostics,” Jang says. In clinical studies, Lunit INSIGHT products for mammography and chest imagery are more than 97% accurate in the detection of lung cancer, breast cancer, tuberculosis, pneumonia, and more.

“Any time you can deliver higher accuracy with greater speed, you’re going to help the patient,” Jang says. “Our customers are radiologists, radiology centers, and public health centers, and they’re telling us they can read x-rays faster now.”

The solution is also finding fans in educational settings and with general practitioners. “Our technology has become very popular with non-radiologists in patient settings,” Jang says. “There are so many chest x-rays that can now be easily and accurately read without having to wait for a radiologist’s report.”

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An algorithm with a future

And it’s only a matter of time before the sophistication of Lunit’s AI can turn its deep learning to other areas of focus. Lunit can already imagine a world where its AI will be able to not only help diagnose the patient, but help guide the patient to the most curative therapy, and even predict which patients will be resistant to certain treatments.

“Our products are diagnostic support tools today. But now we’re envisioning what we can do beyond imaging recognition,” Jang says. “If we can better understand biomarkers, we could eventually predict how patients will respond to immunotherapy.”

It all comes back to Lunit’s belief that AI can do more with deep learning. “When you open the door for the AI to learn beyond human annotation, it can continue to learn on its own,” Jang says. “That kind of AI can save lives.”

EXPLORE MORE

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SOLUTION

• HPE OEM Program

HARDWARE

• HPE ProLiant MicroServer Gen10
• HPE ProLiant DL360 Gen10 servers
• HPE ProLiant DL380 Gen10 servers
• NVIDIA® GPU

SOFTWARE

• Lunit INSIGHT

HPE POINTNEXT SERVICES

• HPE Foundation Care

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a50002710ENW, October 2020