

Editorial: Thomas Edison did not invent the light bulb

Contrary to popular belief, Thomas Edison was not the first to create an incandescent light bulb. Instead, he took decades of science and learning around incandescent technology and was the first to build a practical and affordable light bulb. He also designed and built a power grid and generator system that was necessary to distribute electricity in order to illuminate entire cities.

Similarly, to bring Deep Learning algorithms to clinical practice, we need to build both high-quality models and an infrastructure to ensure that their delivery is reliable, practical, and safe.

Starting with the technology itself, these algorithms must be proven to be robust and accurate. Vendors must show these tools are validated via a rigorous process that ensures safety and efficacy. But algorithm accuracy is just the beginning. They need to be delivered to clinicians in a timely, intuitive manner that allows them to continue owning clinical decisions.

At Arterys, we have spent 5 years creating that infrastructure. Our platform and applications are unique as they are the only FDA-cleared and CE-marked products that combine cloud computing and deep learning. They are in clinical use in 28 countries. This combination is critical: deep learning leads to superior analytics results, and cloud computing provides the power needed to deliver deep learning insights in a timely, interactive fashion to multiple users, without requiring any infrastructure upgrades.

At the outset, our options were installing supercomputers at every hospital, or bringing the image post-processing to the cloud. Because our goal is to make our technology accessible to every clinician, we opted for developing an entirely new cloud infrastructure for medical imaging, as supercomputers would be cost-prohibitive for most institutions.

Cloud supercomputing opens a new era of visualization, with real-time speed compatible with clinical diagnosis workflows. Our advanced visualization platform offers consistent performance via a web browser, no matter where the clinician is practicing. The cloud also allows our users to easily share annotated cases with colleagues and patients.

The other key aspect of delivering useful AI to clinicians is interactivity, and reducing time and frustration with workflows. The system presents clinicians with the deep learning results when the image is opened, allows them to make any edits they deem necessary, and pre-populates a report that reflects their edits, which can also be revised. Arterys provides the leverage of deep learning without the constraints of previous generation automated systems.

Taking images to the cloud poses challenges with data privacy and protection. We developed a sophisticated, proprietary system that leaves PHI at the institution, and only brings images to the cloud, yet allows physicians to easily see the PHI.

Our platform delivers a full machine learning solution while offering intuitive workflows and maintaining data privacy. Our on-market cardiac algorithms are as accurate as expert annotators, and have been used in the clinic on more than 15,000 patients. Now it's all about scale and we're excited to debut new products here at RSNA. Experience our intelligent platform at booth #8361.