

# SFL Scientific

## Company Snapshot

Data Science Consulting for  
Enterprise Applications

SFL Scientific is a data science consulting firm focused on strategy, technology, and solving business & operational challenges with **Artificial Intelligence (AI)**.

Working with clients of all sizes, industries, and AI maturity levels, our capabilities range from developing AI strategy to building custom AI applications at scale. Hundreds of clients—including S&P100 enterprises, fastest-growing startups, and government agencies—trust SFL Scientific to create and accelerate AI initiatives. With a globally connected network of technology and cloud partners, SFL Scientific's core services include leading cross-functional efforts across business, IT, and operations.

## AT A GLANCE

### *Key Facts*

#### **FOUNDED**

2015

#### **HEADQUARTERS**

Boston, MA, US

#### **WEBSITE**

[www.sflscientific.com](http://www.sflscientific.com)

#### **KEY PARTNERSHIPS**

NVIDIA, Microsoft, HPE

#### **TEAM**

US-based Ph.D. data scientists, AI engineers, technical consultants, & R&D experts.

#### **CLIENTS**

Providing strategy and AI services to pharma, medical devices, & life sciences organizations with novel computer vision, NLP, time-series, deep learning, and software solutions.

# AI Solutions for Healthcare & Life Sciences

## Overview

SFL Scientific is a US-based data science consulting firm that works with healthcare & life sciences sector leaders engaged in leveraging analytics and Artificial Intelligence solutions to serve patients and customers more effectively, increase operational efficiency, and develop intelligent tools to solve critical health and diagnostic objectives. Our technology-based, consultative and R&D approach helps many of the best-known organizations build and deploy more efficient and capable systems.

## Your Partner in AI

Every department must invest in Artificial Intelligence and machine learning to improve the time to accurate decisions, while freeing up experts and technicians to do diagnostic and active support work. These AI-augmented systems, combining human intelligence with the power of GPU computing and modern technology, will require careful model development, implementation, and custom solutions designed and integrated by the next generation of data scientists, AI engineers, and software developers. We have deep expertise in the healthcare sector and translate our collective experience in twenty industries to medical applications, bringing use cases, talent, and agile R&D processes needed to take on this immense opportunity.

## Practice Areas

### SFL Scientific AI/ML Research

Developing state of the art algorithms and performing complex analytics, creating new products, tools, and services powered by AI.

Computer Vision  
Natural Language Processing  
Time-Series Analysis / Internet of Things  
Advanced Analytics & Business Intelligence

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### SFL Scientific AI Systems & Technology

Defining data architectures, refreshing IT infrastructure and services, developing applications and governance to support data processing and AI workloads.

Data Engineering & Architecture  
DevOps / AIOps  
Cloud Enablement & HPC

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### SFL Scientific Consulting

Helping clients define their data and AI strategy, business processes, use cases, and validate emerging technology solutions.

# What sets our **strategic & AI services** apart?

## Accelerating AI Development

SFL Scientific focuses on areas where we believe we can have the most impact by integrating AI into standard workflows and procedures at data capture. Working from strategy to implementation allows us to be a valuable player for each initiative. We help develop and deploy systems that monitor, learn, and inform, sifting through petabytes of text, image, user, device, and sensor data. By applying our data science approach and methodology to our clients, we deliver a partner-led planning process that enhances solution integration, risk identification, and a full assessment to develop a comprehensive technology roadmap and scalable solutions.

## Recognition

NVIDIA Partner of the Year for AI Services 2019, 2018

NVIDIA Preferred Service Provider, Deep Learning

[NVIDIA AI Starter Kit - Consulting Expert](#)

Microsoft Gold Certified Partner

Microsoft AI Inner Circle Member

Microsoft Gold Cloud Platform Competency Partner

Microsoft Silver Data Analytics Competency Partner

Microsoft Silver Application Development Competency Partner

01

## Fully US-Based Technical Team

Multidisciplinary team of Ph.D. data scientists & AI engineers providing agile services, comprehensive solutions, and implementation governance throughout an organization.

02

## Power Ecosystem, First Mover

Long-term, trusted partner relationships helping to scale and manage our clients' most essential business processes. Recognized by NVIDIA, Microsoft, and other major IT & engineering organizations as a consulting partner that integrates diverse solutions.

03

## Custom Development

Creating custom solutions to address specific needs for generating operational and R&D outcomes. We understand the full AI lifecycle including data management, DevOps, and AIOps.

04

## Strategy & Rights

Trusted advisor and development partner to executives, helping to understand and evaluate essential areas for investment. Our clients retains all methods, code, and IP rights.

# SFL Scientific Leadership Team



## Michael Segala, Ph.D. Co-Founder & CEO

**Dr. Michael Segala** is a Ph.D. physicist and the CEO of SFL Scientific, a US-based data science consulting firm specializing in developing production-grade machine learning and artificial intelligence solutions. Michael leads SFL Scientific in its mission of delivering state-of-the-art algorithms to enhance research and operational capabilities that drive performance and new capabilities. He specializes in solving complex problems, including developing AI for diagnostic tools, natural language processing, anomaly detection via deep learning, and advancing AI research for defense applications.



## Daniel Ferrante, Ph.D. Co-Founder & CDO

**Dr. Daniel Ferrante** is the Chief Data Officer of SFL Scientific, designing and implementing data science and Data/AIOps strategies to help clients accelerate the adoption of digital and AI emerging technologies. His professional career has included developing novel deep learning frameworks at national laboratories, the implementation and oversight for high-performance computing infrastructure, and other distributed computing systems, from commission to security and system administration. Dr. Ferrante has worked with 25% of the S&P100 in development and technical efforts integrating AI and information technology from NVIDIA, Microsoft, Cisco, and other global IT and services organizations.



## Michael Luk, Ph.D. Co-Founder & CTO

**Dr. Michael Luk** is the CTO of SFL Scientific, LLC, an industry adviser at Brown University, and a CTO adviser to S&P 500 organizations. He studied theoretical physics at Imperial College London, mathematics at the University of Cambridge, England, and trained as an experimental particle physicist at Brown University working at CERN, leading to the discovery of the Higgs Boson. Starting at Intel and working in technical consulting and AI professional services, Michael has become a recognized expert in developing AI and natural language processing pipelines, having developed and managed production systems as the backbone of business operations for startups to multibillion-dollar organizations.

# SFL Scientific & Microsoft Azure

## MACHINE LEARNING ON AZURE

Azure is a robust service that covers the development and deployment needs of businesses across the world, Azure Machine Learning is the cloud-based service model that gives Enterprises the ease to integrate **Data Analytics solutions** with **AI capabilities** on the go. The model is self-intuitive and enables one to build AI applications faster and easier. The beauty of this platform is the fact that it can gel with any or all kinds of products and offers the flexibility to deploy feature-rich models at a pace faster than ever. With Azure machine learning, you have access to some of the most advanced machine learning capabilities, including **build, train, and deployment learning models** that can streamline your work system in no time.

SFL Scientific a member of the Microsoft's **AI Inner Circle Program**. Our team of Ph.D.-level Data Scientist are capable of harnessing the power of the Azure platform to develop novel solutions to your enterprise problems. As a **Cloud Platform, Application Development & Data Analytics Competency Partner**, SFL Scientific is uniquely qualified to help organizations address their AI strategy, develop custom algorithms, deploy scalable architecture and manage enterprise grade AI / ML solutions. The SFL Scientific team background in STEM subject and Boston location has afforded us the opportunity to work with many leading healthcare and life science organizations.

Gold

# Microsoft Partner



Cloud Platform

Application Development

Data Analytics

# Trusted by Leading Healthcare & Life Science Organizations Worldwide

Multinational  
Pharmaceutical



CROs &  
Services



Payers &  
Providers



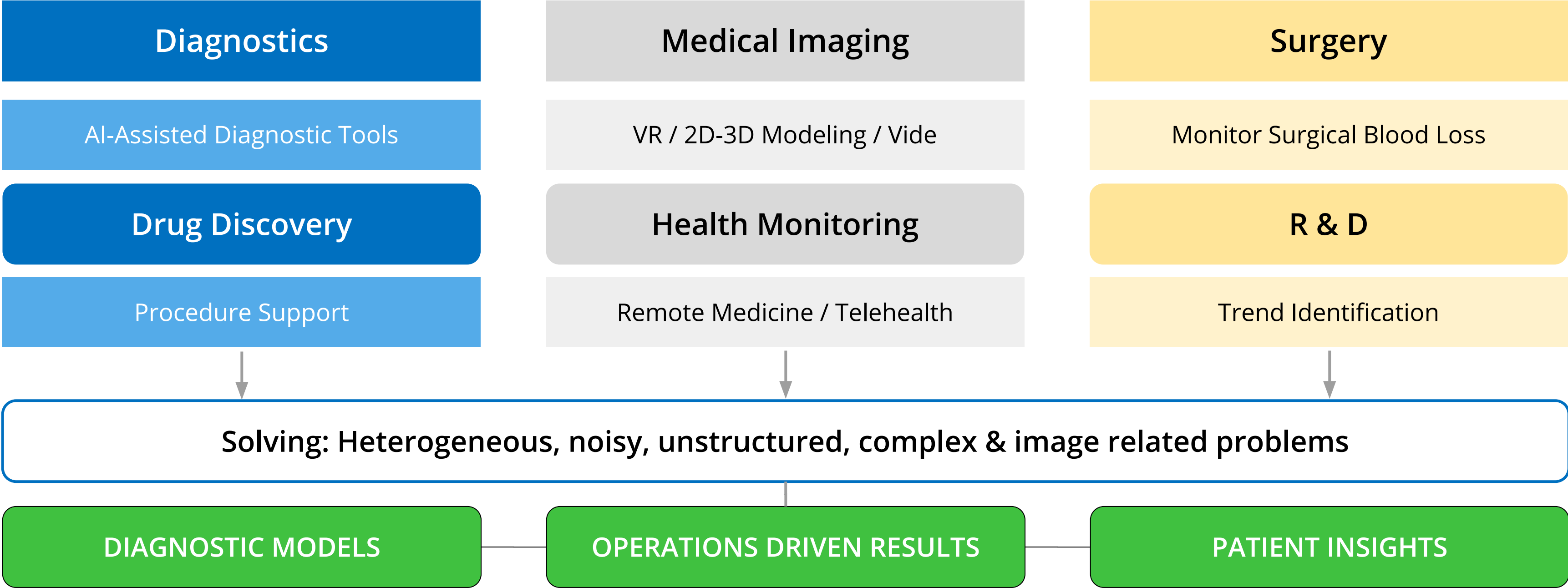
Medical  
Devices



Consumer  
Goods

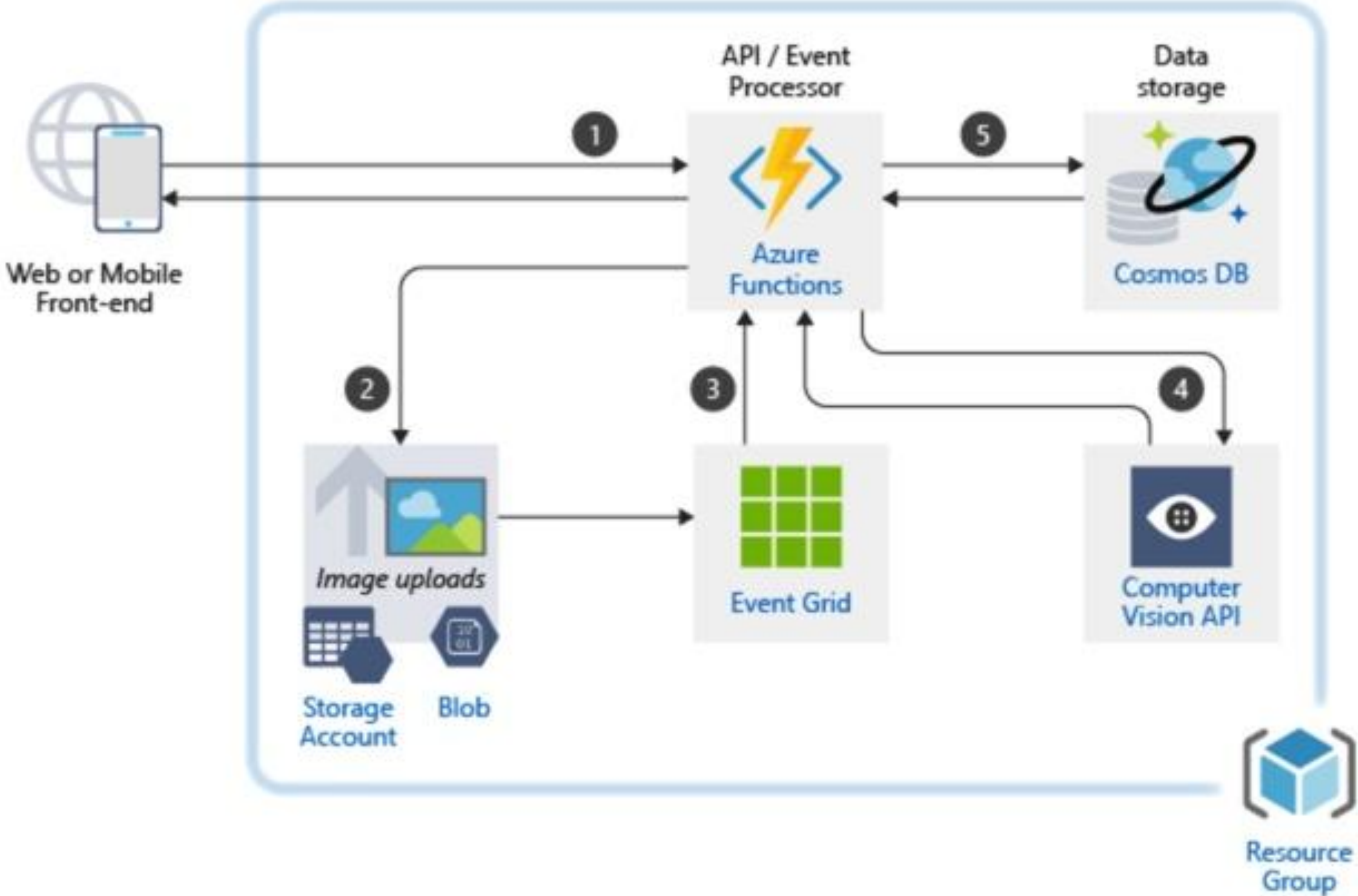


# Computer Vision Applications in Healthcare & Life Science





# Azure Reference Architecture for Computer Vision

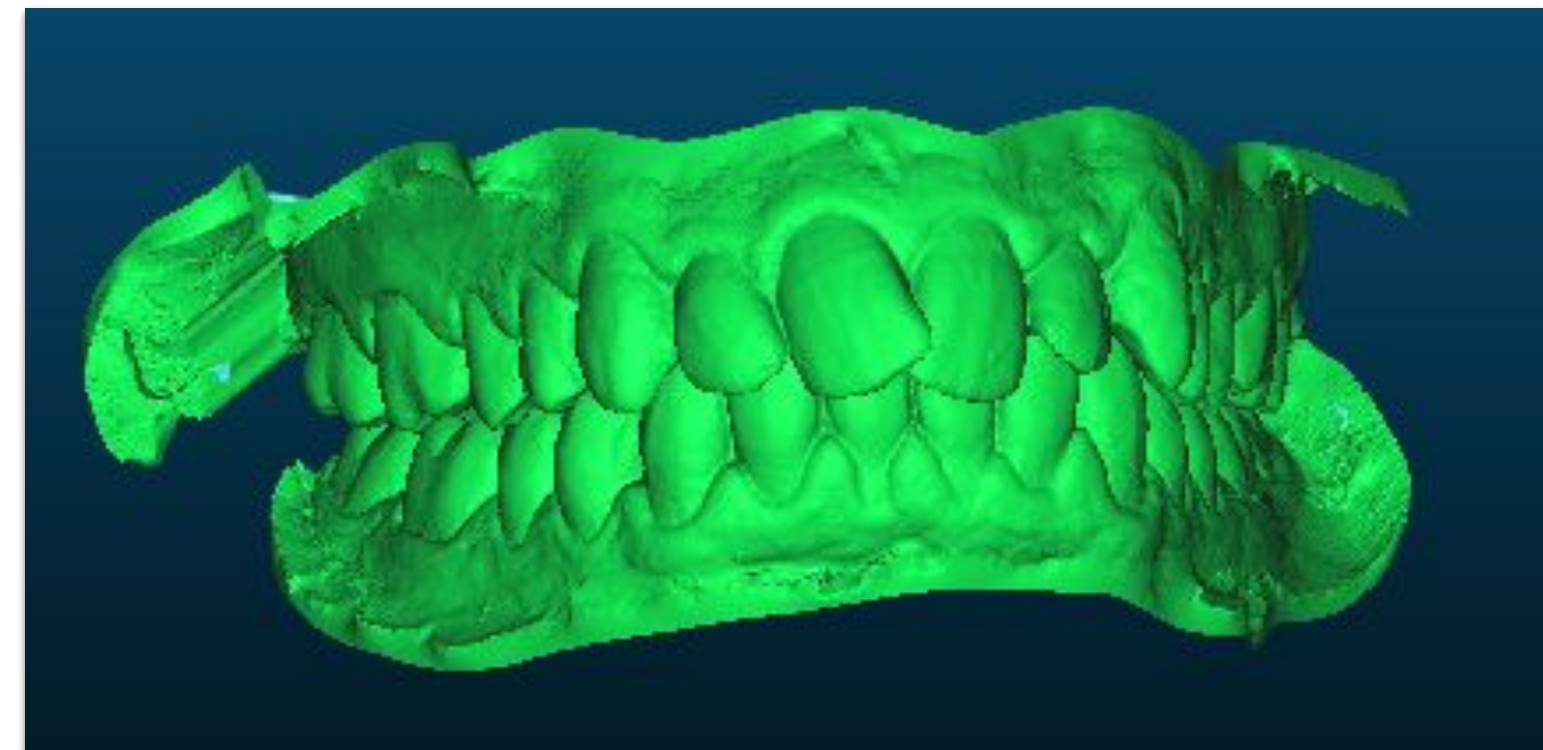
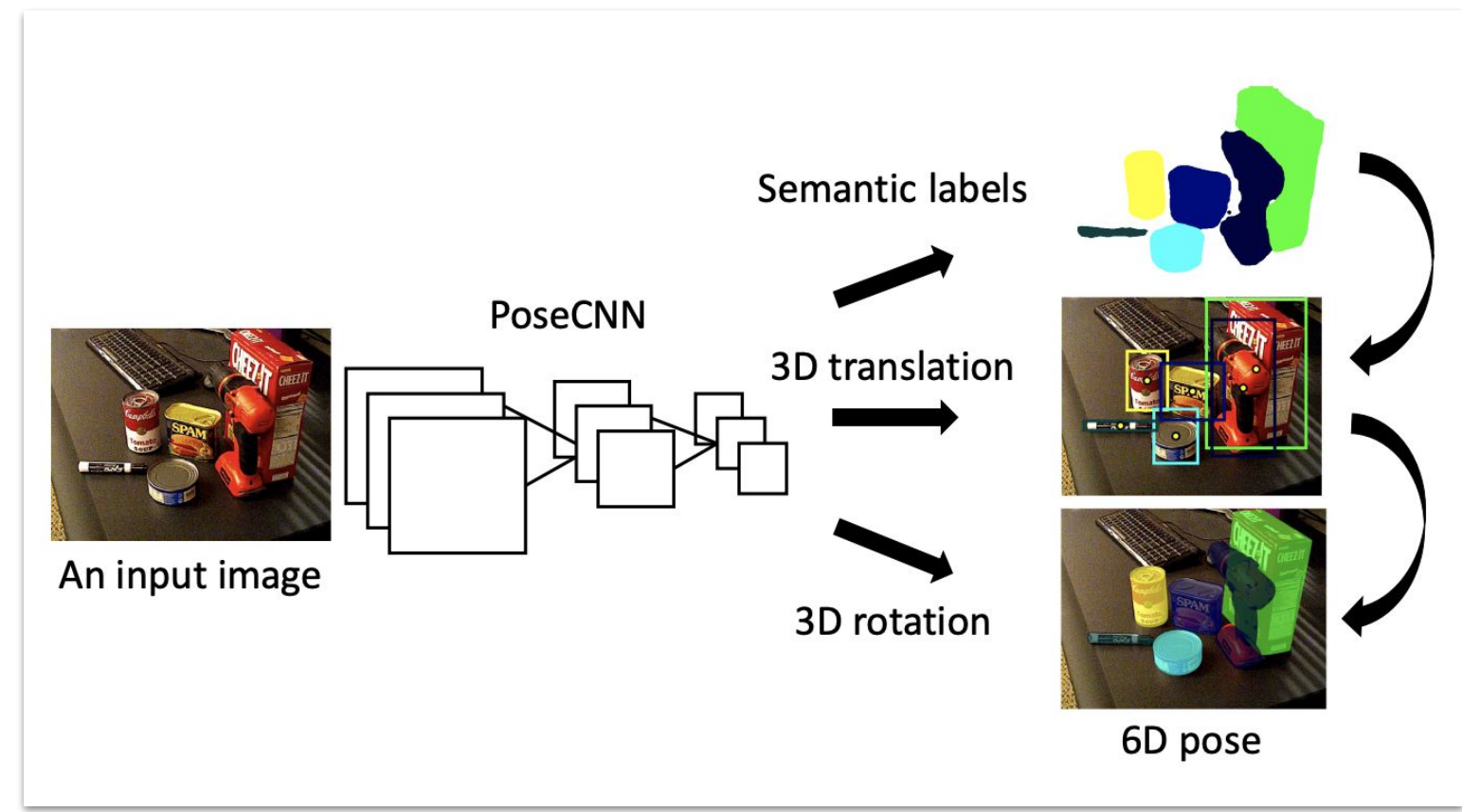


# Automated Dental Treatment Planning on 3D Meshes

Working with an international orthodontics company, our objective was to construct a fully autonomous treatment plan given an initial mouth scan and final desired state.

Currently, treatment planning [12+ steps] is created by a dentist and takes over 30 minutes, resulting in dependence on professional review and quality. Our goal was reduce this to create a technology stack that can be deployed outside a clinical office and produce results in under 15 seconds, creating an unbiased, expert system that is infinitely scalable.

**Outcome & Impact:** The developed system is based on computer vision [deep learning-based] techniques to classify, localize, and detect pose from 3D Mesh scans. The system ingests over 100,000 points and accurately predicts treatment path down to 100 μm. Embedded in this system are state-of-the-art pose estimation algorithms to determine the exact geometry of each tooth.

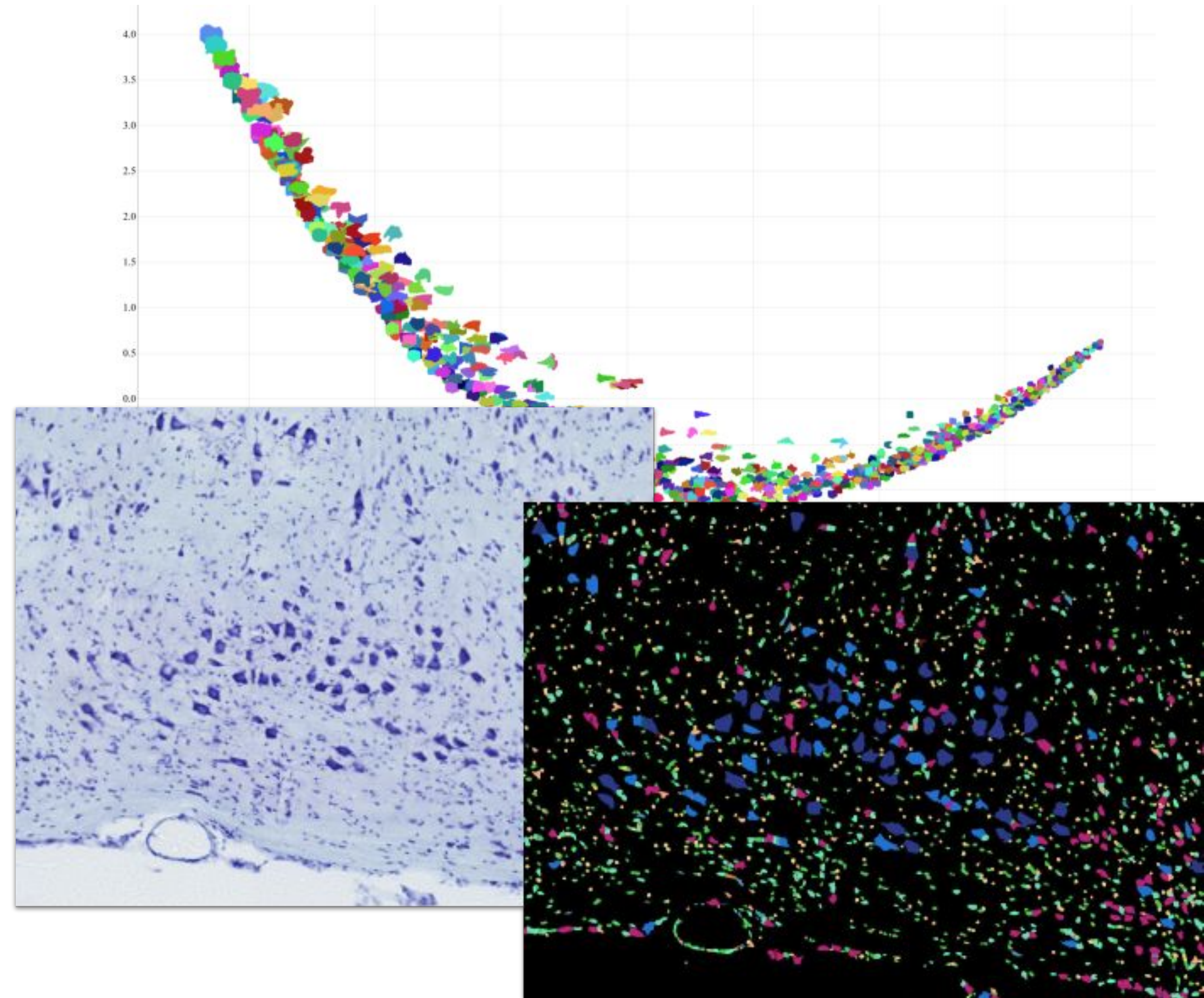


# Cell & Region-Based Detection System

Our work with a leading research & pharmaceutical organization focused on developing diagnostic tools, augmenting expert capabilities, & replacing legacy code-bases & systems.

The deep learning powered engines connect high-throughput microscopes and imaging systems with CNNs that perform above human accuracy with near infinite scaling and speed for even large histological data of 50k x 50k pixels in whole-slide imaging.

**Detection Ability:** The system processes patches to identify structures and features on a pixel by pixel level. We also explored ways to make output interpretable by various methods including low dimensional representations, texture ranks, cell shape ranking, spectral clustering, and other use case specific methods and parameters.

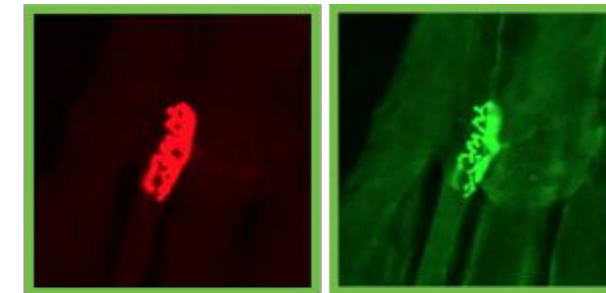
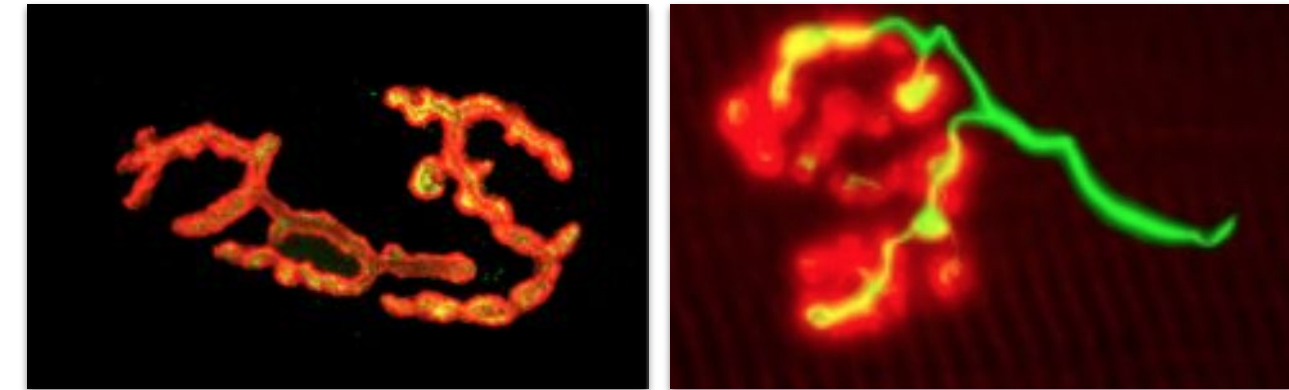


# Drug Development Cell Counting Pipeline

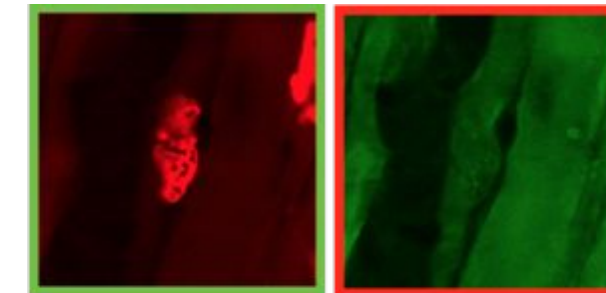
Working with a top 20 biotechnology company, SFL Scientific developed a modular pipeline to reduce expert review.

Client requirements included developing an expert review UI, annotation and image-linked LIMs, automated detection system for AF488 and TMR  $\alpha$ -Bungarotoxin tagged NMJs, and robust quality control tool to view high-resolution images for IHC review.

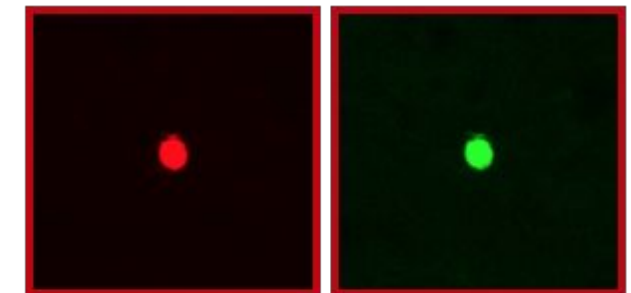
**Detection Ability:** SFL Scientific helped bootstrap a patch-based computer vision system to build ground-truth data in Phase I. With a gold standard dataset established, in Phase II, a deep learning-based solution was deployed into the production environment for cell counting and analysis. The solution reduced expert review from 4 hours per sample to 3 minutes. Statistics for multi-class labels, potential false positives/negatives are presented for validation continuously as protocols change.



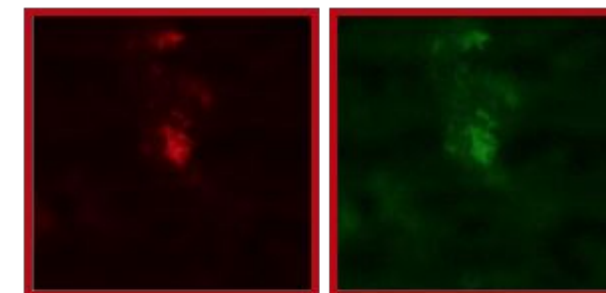
NMJ is IDed in both channels.



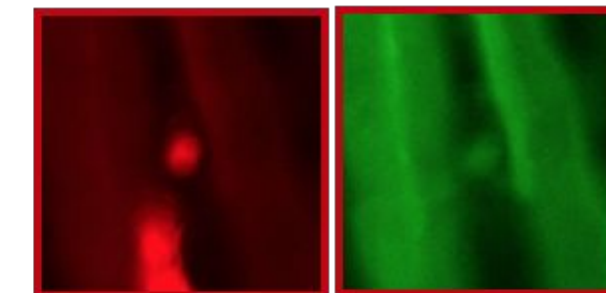
Pass TMR. Fail VACHT.



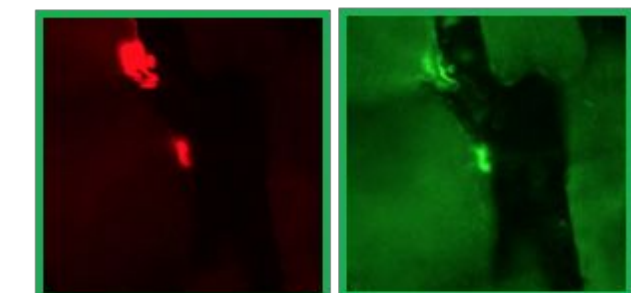
Not on tissue; too circular.



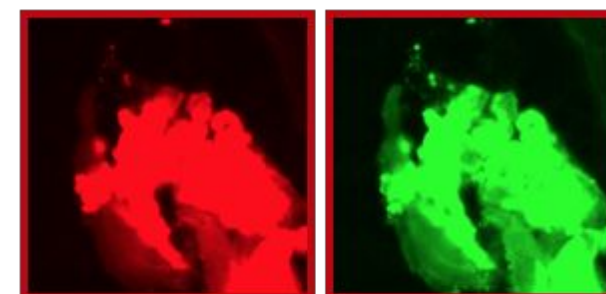
NMJ object is not present.



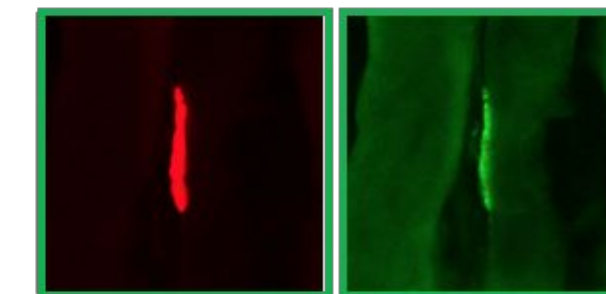
Entire image is out of focus.



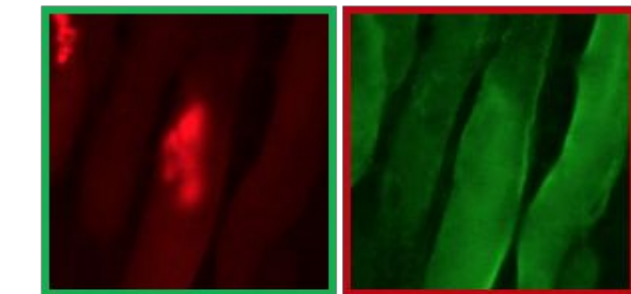
Partial NMJ detected.



Foreign Object/Contamination.



Large NMJ, sliced through on side.



TMR is OOF. No VACHT.

# CONTACT US



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