BIOVIA

3DEXPERIENCE®

BIOVIA PIPELINE PILOT IMAGING COLLECTION

Datasheet

BIOVIA Pipeline Pilot's Imaging Collection revolutionizes image informatics in life sciences, clinical research, chemistry, materials science, and more. With its dataflow automation and visual programming capabilities, the Imaging Collection simplifies access to advanced image and video analytics.

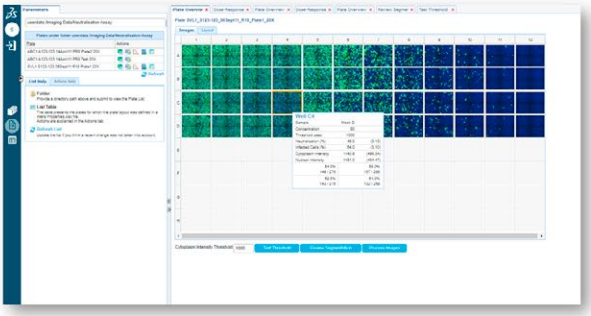
This comprehensive image informatics toolbox offers a wide range of components and protocols, specifically designed for image processing. Integration with machine learning algorithms and deep learning frameworks allows for predictive modeling, and empowers researchers to efficiently extract valuable insights from complex imaging data. Combining imaging data with other data types (sensor, numeric, text, chemical, and biological) and harnessing Pipeline Pilot's open server architecture, the Imaging Collection enables users democratize computer-vision-based scientific workflows through its Web Port, making them accessible as "mini-apps" (protocols). This streamlined access and collaboration lead to faster and more informed decisions.

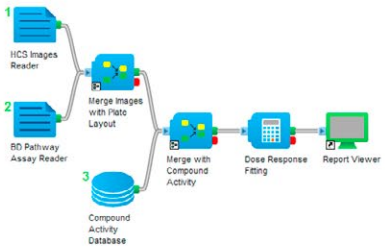
DASSAULT SYSTEMES

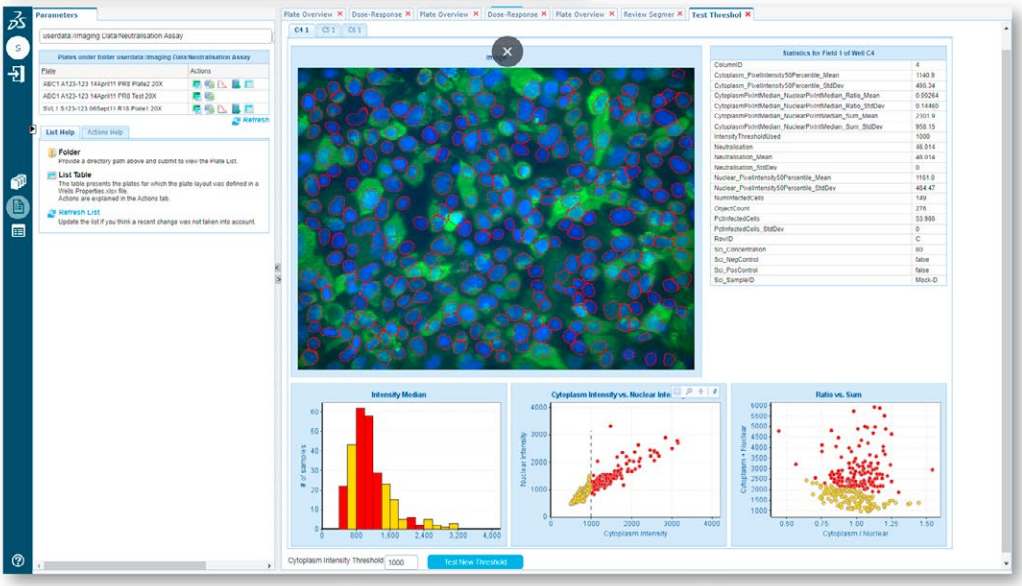
BENEFITS OF BIOVIA PIPELINE PILOT IMAGING COLLECTION

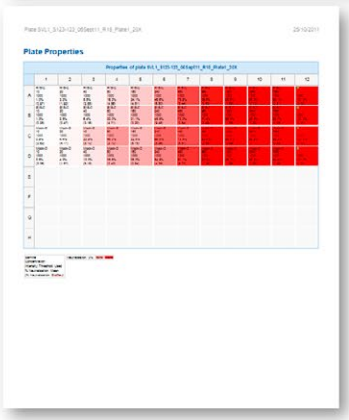
EASILY AUTOMATE AND STREAMLINE IMAGE ANALYSIS WORKFLOWS WITH LOW-CODE/ NO-CODE SOLUTIONS

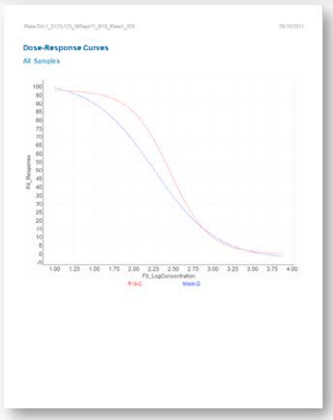
- Automate error-prone manual tasks such as data collection (image and non-image format), data cleaning, importing, processing, analyzing, as well as generating reports and sharing the results
- Import and read image data (DICOM, TIFF, PNG, JPEG, etc), pre-process, annotate, measure, and process them using advanced machine learning algorithms for segmentation, detection, or classification purposes and to create custom interactive reports of the performance with image-data links
- Capture and deploy best practices in an intuitive web-based environment that allows end-users to leverage the power of Pipeline Pilot within a simple point-and-click interface











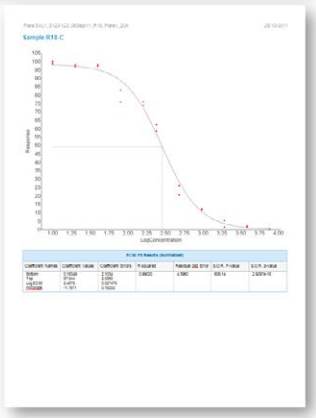


Figure 1: Quantification of the virus neutralization from confocal images with a protocol using computer vision algorithms for segmentation. The protocol allows extracting data from the plate reader, prediction of pixel masks of cytoplasmic (virus) and nuclear stains, automation of dose response fit calculation and reporting the results.

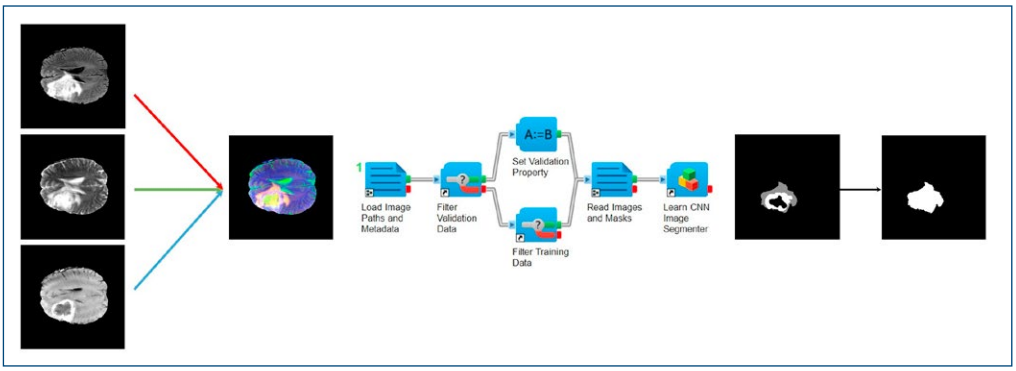


Figure 2: Prediction of pixel masks of tumors from 2D image slices of brain MRI scans with U-net based training protocol that uses deep learning algorithm for segmentation.

COMPUTER VISION AT SCALE

- Deploy comprehensive classification algorithms based on available deep learning methods off the shelf, pre-trained on Image-net that could be on all other image types
- Customize easy to use Python programmable components for your image processing tasks with the ability to create and associate with certain Conda or virtual environments
- Scale to the processing power that is right for your imaging needs with the ability to use both CPU and GPU machines for parallel processing, grid engines, and cloud computing
- Create customized reports and web applications with powerful tables, charts, images, text, and links

ENHANCED EFFICIENCY AND PRODUCTIVITY

- Shorten the time-intensive cycles of compiling and reviewing lengthy codes with "on-the-fly" debugging for immediate deployment provided by the Design Mode in Pipeline Pilot
- Rapidly optimize the pipeline's efficiency and quickly build high- quality solutions via an intuitive design mode providing a data investigation interface with step-by-step caching of data, data inspection tools, and run time information.
- Document and reproduce the steps used to achieve a particular result by versioning the image processing and analysis procedures
- Reduce costs and time-to-market with a higher return on investment for Senior Management

COLLABORATION ACROSS THE ENTERPRISE

- Collaborate among extended teams and across the enterprise with corporate portal integration capabilities to share images and related data
- Publish and share your developed protocols with other team members via Pipeline Pilot web client to facilitate cooperative development and knowledge transfer
- Rapidly develop custom drill-down, image-based reports to foster knowledge sharing
- Increase security through the use of role-based authorization and folder security

DATA ANALYSIS FROM MULTIPLE SOURCES IN REAL TIME

- Bring your images from in-house databases, files, vendor platforms, and instruments combined with other associated data, all in one environment, enabling data analysis in real time
- Integrate data in various formats including images from all scientific domains, or common and complex scientific data for improved knowledge and decision making
- Access to data on commercial and open source imaging software applications, enterprise data management systems, and corporate portals in applications such as Oracle and SharePoint to leverage existing investments, improve productivity, and optimize processes

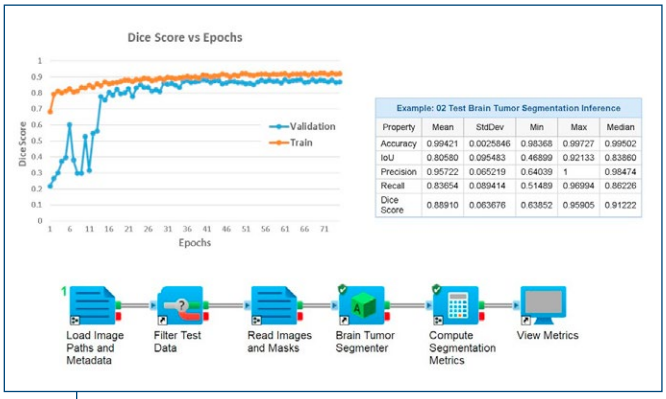
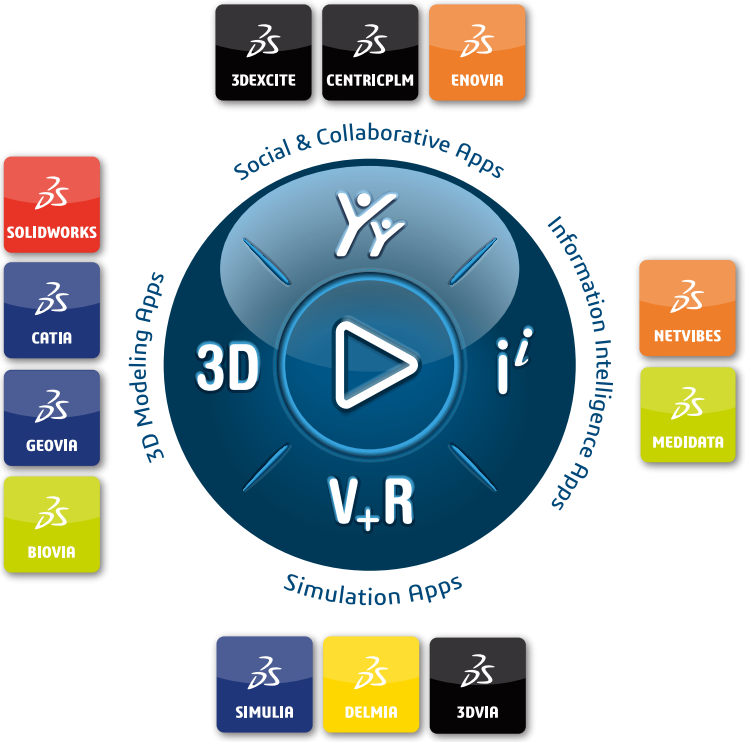


Figure 3: Train and validation loss progress along 75 epochs of training, Inference protocol, and results of inference on images from an independent test set in terms of IOU, Dice score, Accuracy, Precision, and Recall.

CONSISTENT ADOPTION OF NEW SCIENCE

- Stay at the forefront of image and video analytics with cutting-edge technologies such as Federated learning, Generative Models, localization algorithms, and more

LEARN MORE



Our **3D**EXPERIENCE® platform powers our brand applications, serving 11 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the **3D**EXPERIENCE Company, is a catalyst for human progress. We provide business and people with collaborative virtual environments to imagine sustainable innovations. By creating 'virtual experience twins' of the real world with our **3D**EXPERIENCE platform and applications, our customers push the boundaries of innovation, learning and production.

Dassault Systèmes' 20,000 employees are bringing value to more than 270,000 customers of all sizes, in all industries, in more than 140 countries. For more information, visit **www.3ds.com**.

Europe/Middle East/Africa
Dassault Systèmes
10, rue Marcel Dassault
CS 40501
78946 Vélizy-Villacoublay Cedex
France

Asia-Pacific
Dassault Systèmes K.K.
ThinkPark Tower
2-1-1 Osaki, Shinagawa-ku,
Tokyo 141-6020
Japan

Americas
Dassault Systèmes
175 Wyman Street
Waltham, Massachusetts
02451-1223
USA

DASSAULT SYSTEMES | The **3D**EXPERIENCE® Company