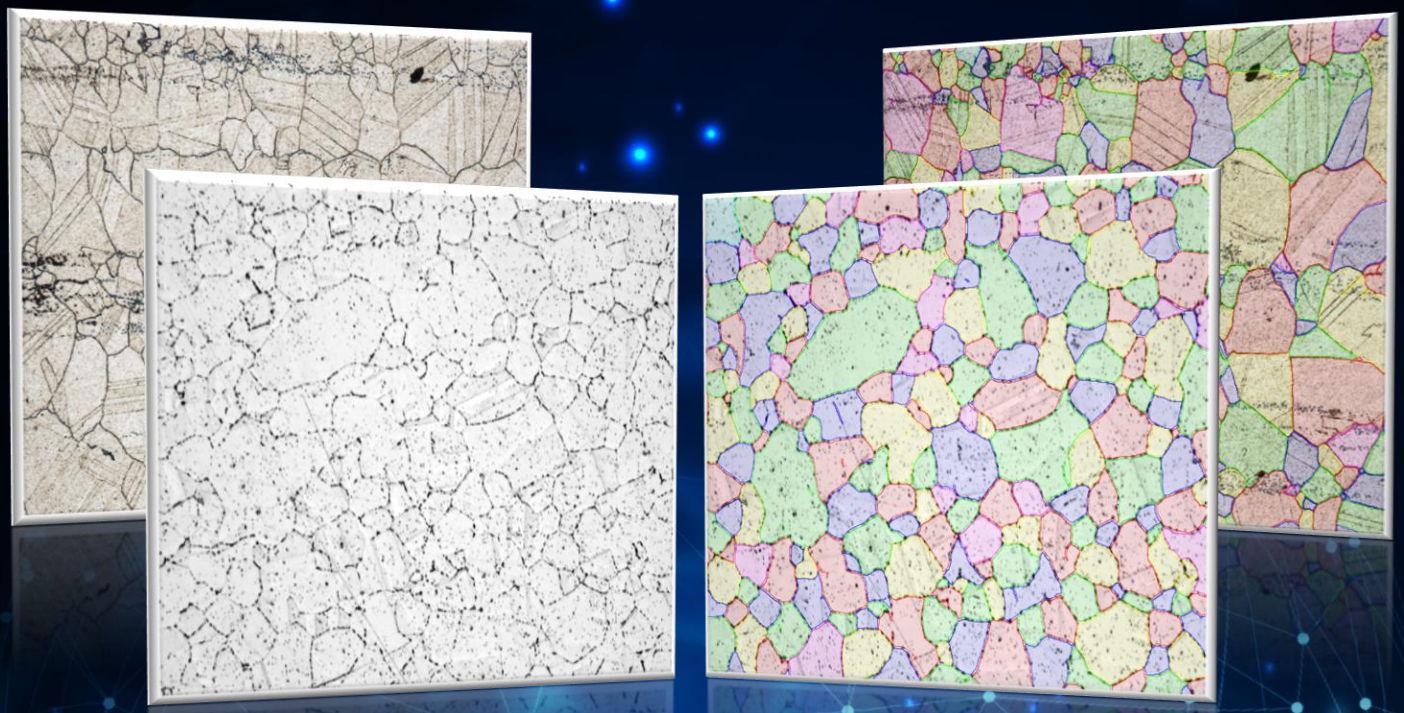
Artificial Intelligence detection for Grain Size



Discover more about
One-click solutions using
Artificial Intelligence

Aluminium

Austenite

Brass

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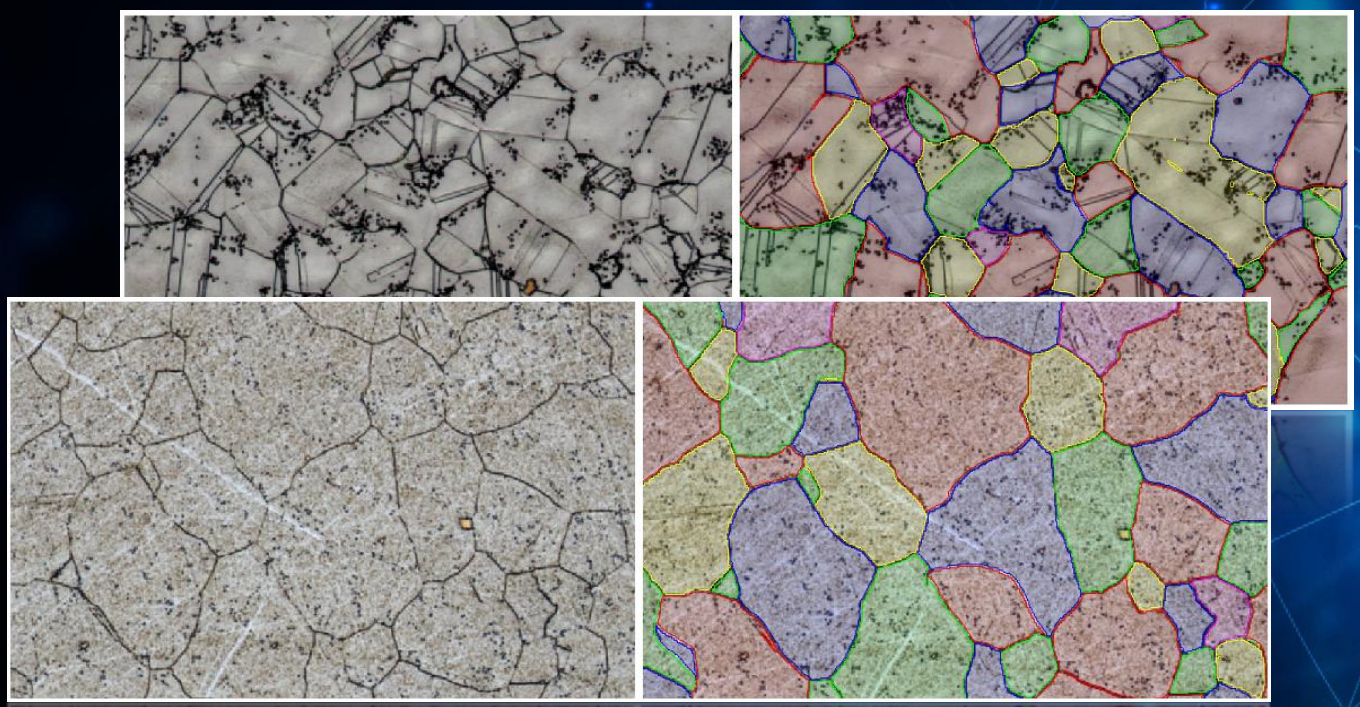
Automatic Segmentation

Artificial Intelligence (AI) and deep learning make the segmentation absolutely effortless. Segmenting grains using manual thresholding can be very tricky and tedious – this is now past.

➢ One-click detection

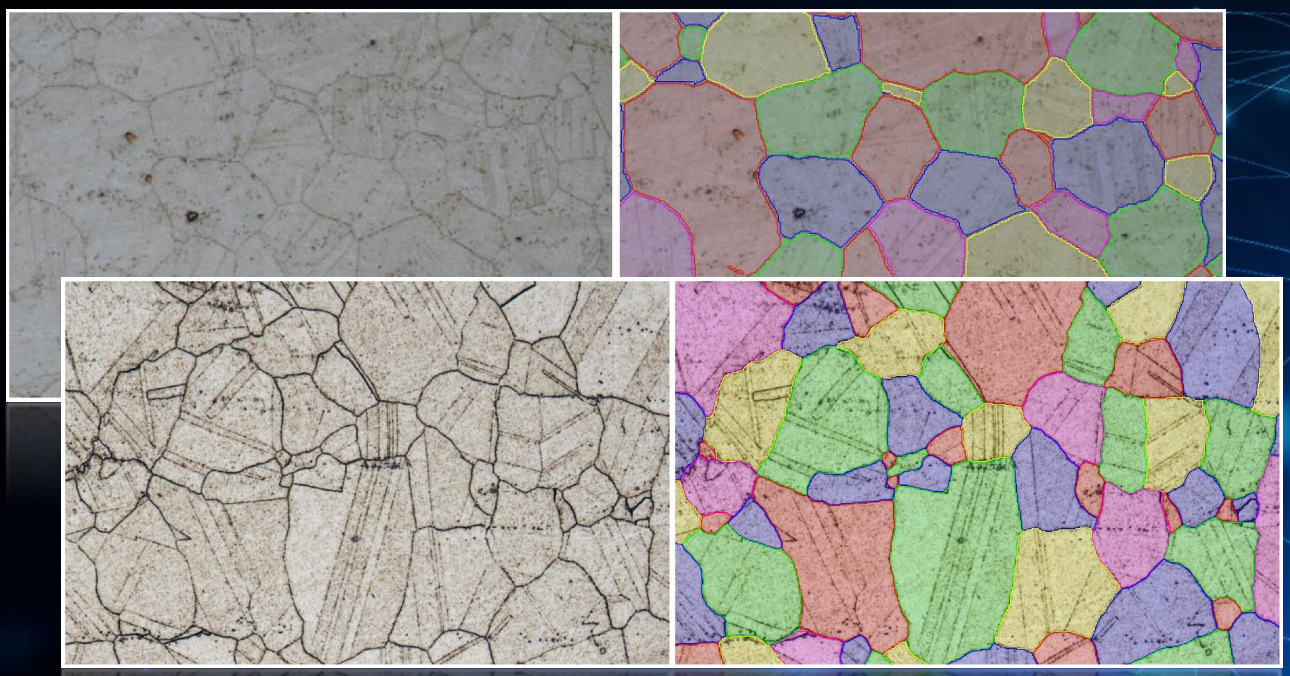
Automatic and complete image segmentation without complicated workflows is provided by just one-click using AI in NIS-Elements.

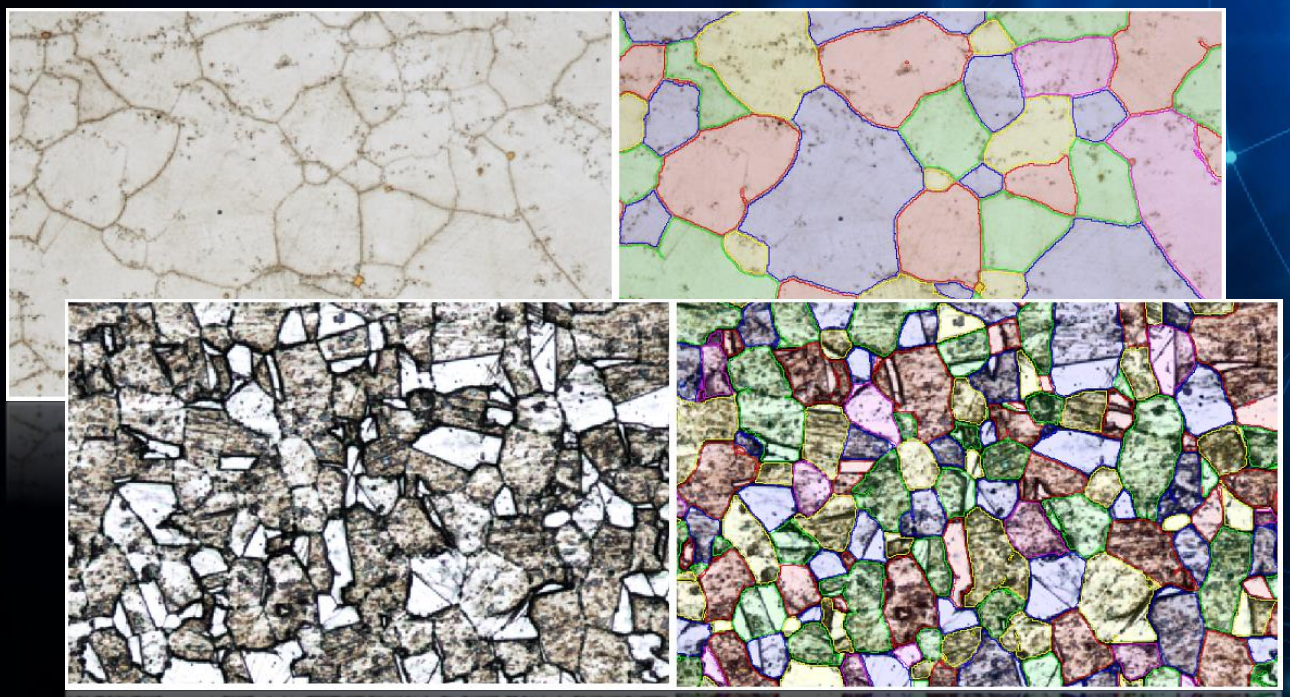


➢ Sample type flexibility

AI network can recognize grains on wide variety of images as it has been trained on large amount of samples prepared with different procedures.

- AI segmentation results
  - The results of AI segmentation on various sample without any further adjustments:





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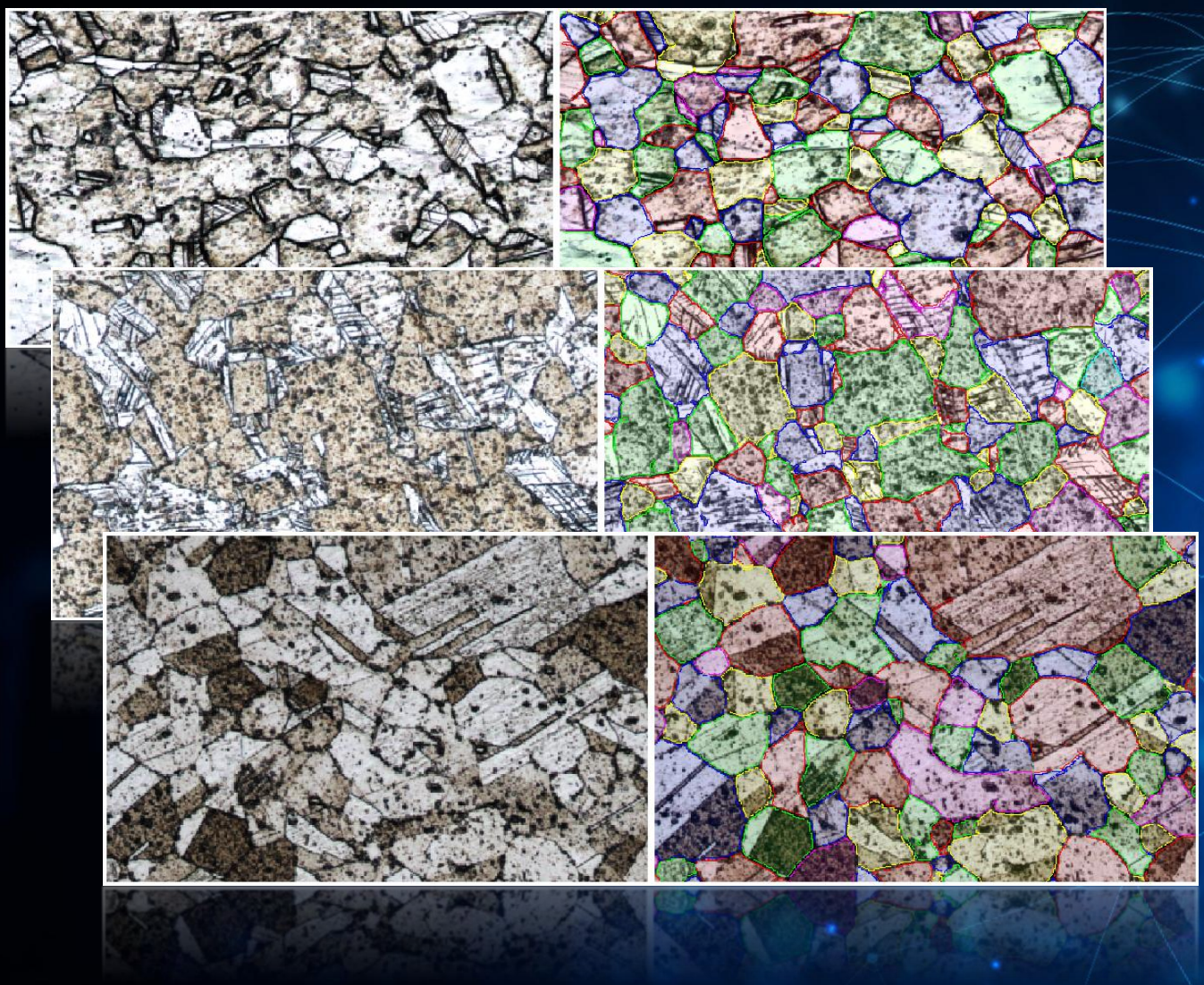
➢ AI segmentation results



Reliable AI grain detection currently works primarily on Austenitic and Ferritic one-phase structures.

Additional image samples are being continually added into the AI network to offer customers the best and the most comfortable grain segmentation on the market.

All mask segmentation results on images in this brochure have been created purely by our AI and have not been further altered or adjusted in any way.

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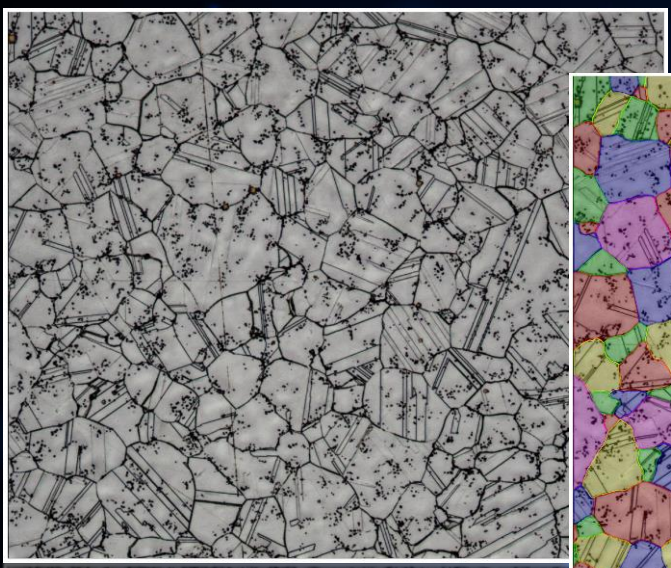
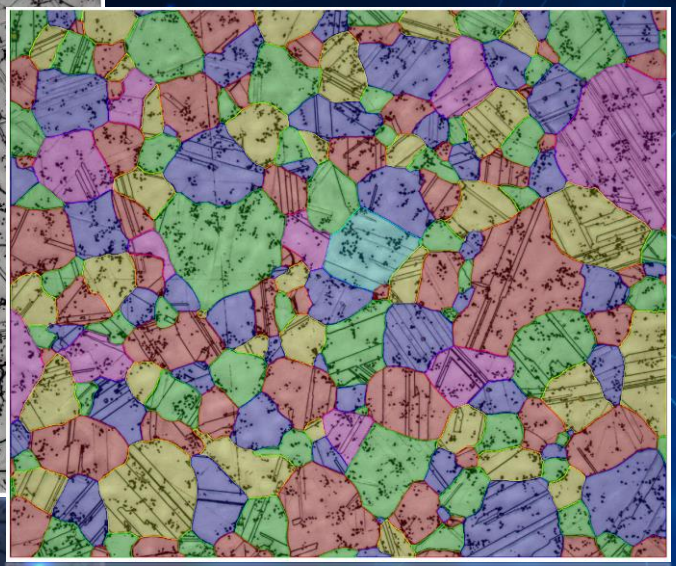
Advanced features

Brilliant capabilities of AI provide accurate grain detection in NIS-Elements even on images containing various segmentation difficulties. For example:

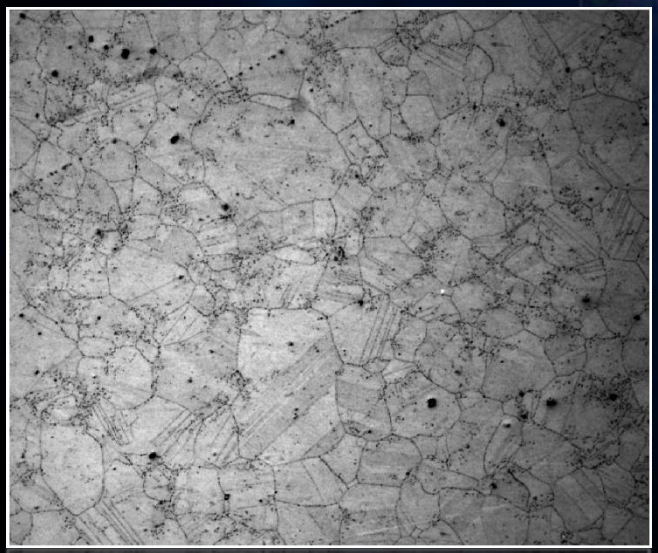
- Annealing twins

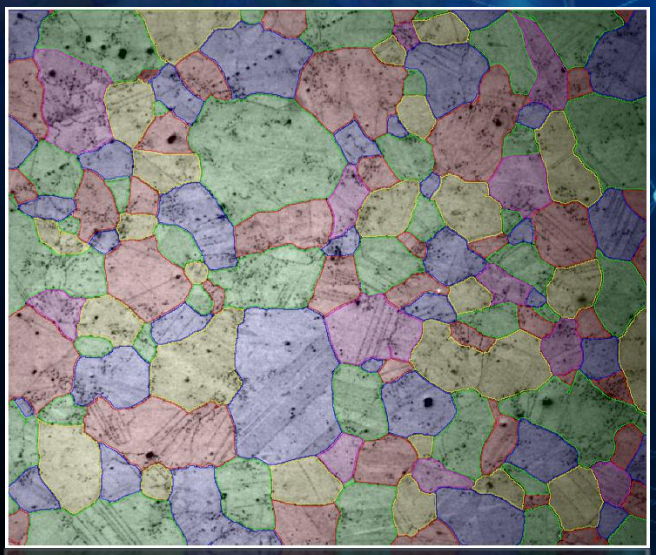
  AI's unparalleled ability to detect grains containing annealing twins decisively surpasses conventional segmentation methods.





- Samples with shading





AI network is trained to correctly identify individual grains also on the images with shading. Achieving such excellent results is very difficult using common segmentation methods.

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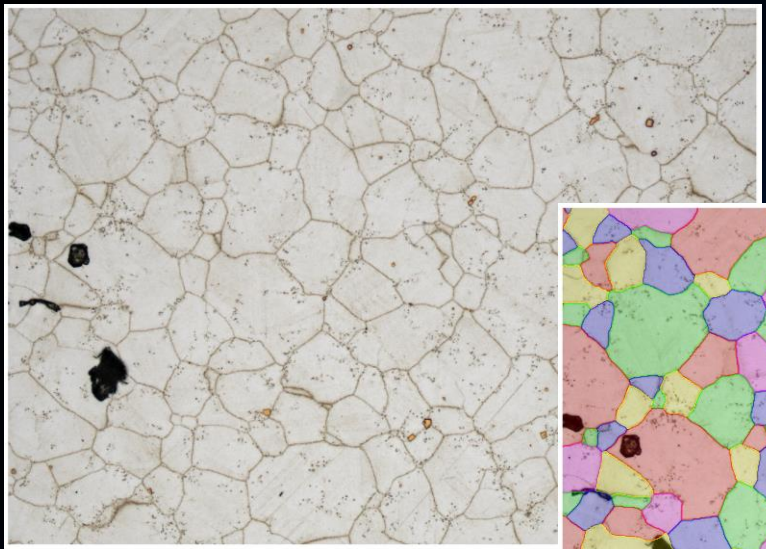
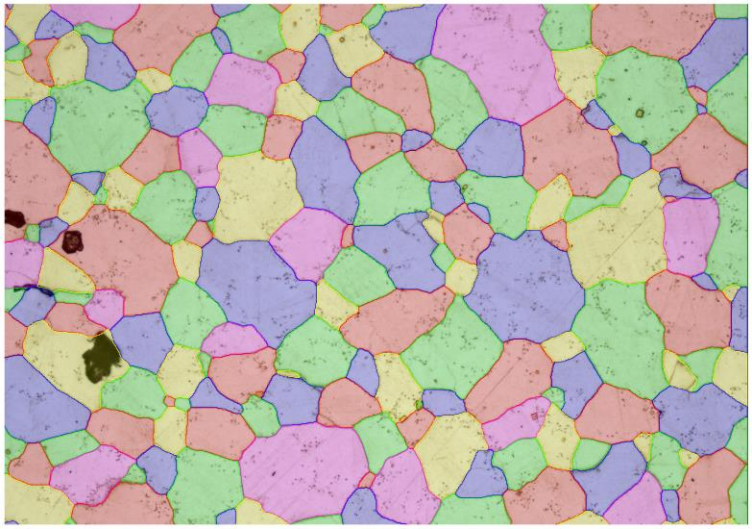
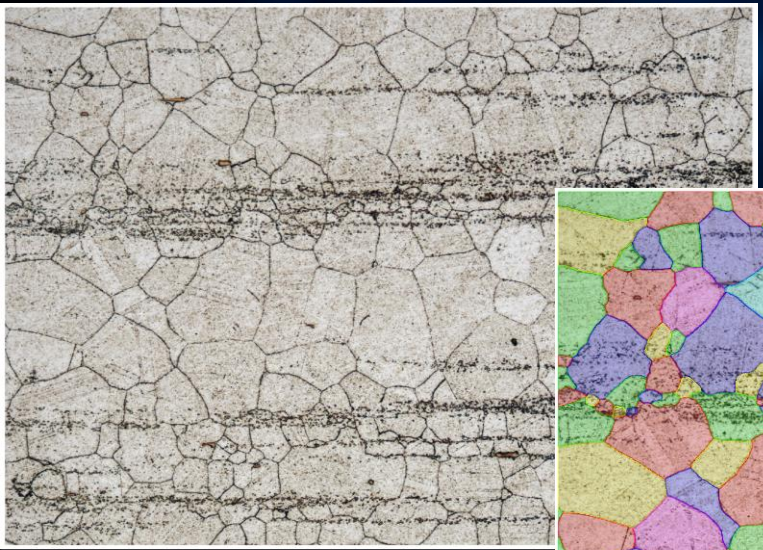
➢ Samples containing particles



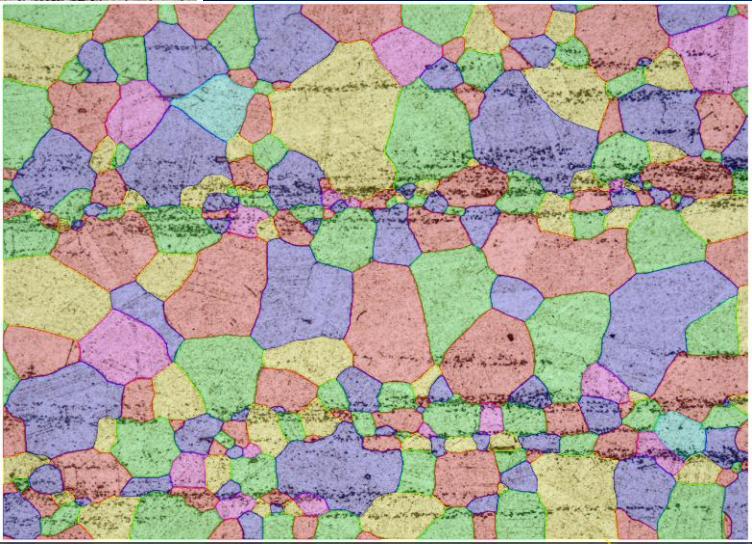
Grain detection using AI in NIS-Elements properly segments grains on images containing various interfering particles or defects.



➢ Scratched samples



AI capabilities can automatically and correctly segment grains even on scratched or similarly damaged samples.



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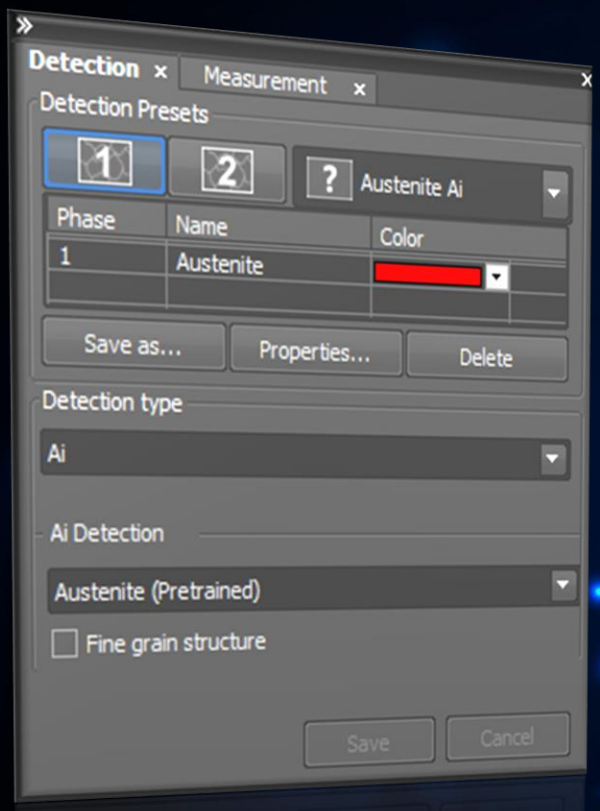
Already pretrained for you



And the best part? Grain Size AI detection in NIS-Elements comes already ready to use! Simply click and the AI detection will do the work for you all by itself.

Customize your own AI

Do you have samples you would like to achieve better results on? Create your own custom AI for specific samples using the NIS-Elements NIS.ai module to get the best results possible.

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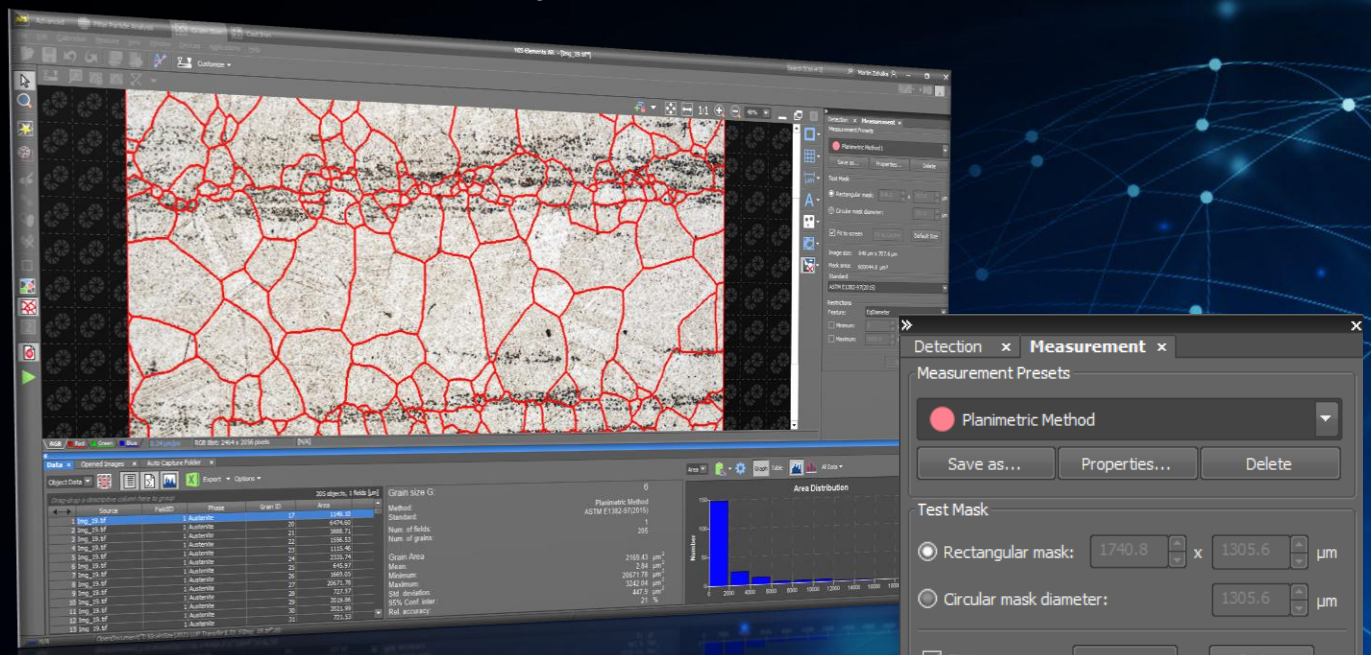
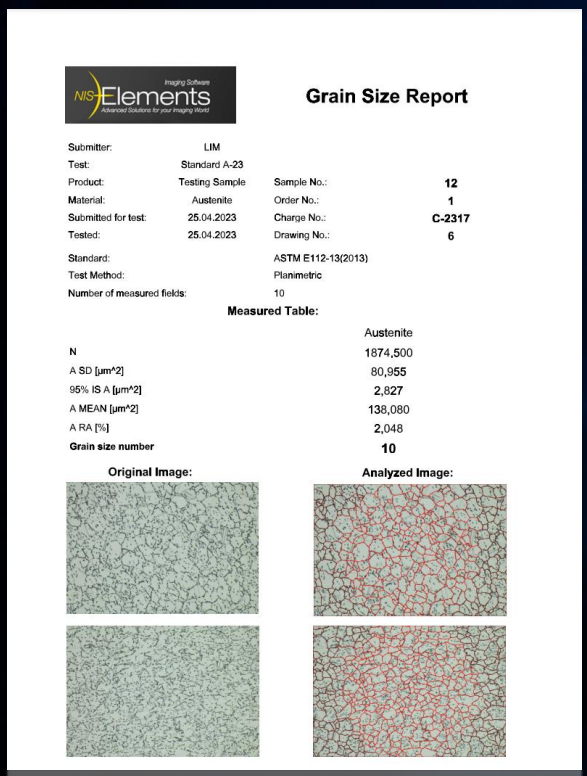
Automatic complete grain size results with just one-click



Various measurement methods including the Planimetric and the Abrams method.

In accordance with:
ASTM E1382-97 and E112-13
JIS G0551
ISO 643
GB/T 6394



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Grain Size Report

Submitter:	LIM		
Test:	Standard A-23		
Product:	Testing Sample	Sample No.:	12
Material:	Austenite	Order No.:	1
Submitted for test:	25.04.2023	Charge No.:	C-2317
Tested:	25.04.2023	Drawing No.:	6
Standard:		ASTM E112-13(2013)	
Test Method:		Planimetric	
Number of measured fields:		10	

Measured Table:

	Austenite
N	1874,500
A SD [µm^2]	80,955
95% IS A [µm^2]	2,827
A MEAN [µm^2]	138,080
A RA [%]	2,048
Grain size number	**10**

Original Image: **Analyzed Image:**

Complete measurement results in Report including the number of measured fields or images, the number of grains and the grain area (mean, minimum and maximum) using NIS-Elements

We would like to express our gratitude to UJP PRAHA a.s., Nad Kamínkou 1345, Prague 5 Zbraslav, Czech republic, for providing us a wide variety of samples for the AI development and kind approval to use them in our Grain Size brochure and presentations.

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➢ Products required for this application

Modules

Grain Size

Grain Size

+

AI Runtime

AI Runtime

Any of the software packages below

Ar
Advanced Research

NIS-Elements Advanced Research

Optimized for advanced research applications. Nikon's flagship software package features fully automated image acquisition, advanced device control and powerful analysis and visualization tools

Br
Basic Research

NIS-Elements Basic Research

Developed for standard research applications such as analysis and photo-documentation of fluorescent imaging, NIS-Elements BR features up to four-dimensional acquisition and advanced device control capabilities

D
Documentation

NIS-Elements D

Software package for photo-documentation. Includes basic measuring and reporting tools.

➢ Contact us

For more information about our solutions, please contact your local Nikon representative at

- www.industry.nikon.com

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