

User Group Meeting 2017

Christof Reinhart, CEO Volume Graphics



Program UGM 2017

Wednesday, September 13, 2017

Thursday, September 14, 2017

Time	Program Item	Speaker	Time	Program Item	Speaker
9:00 am	Opening of Exhibition		9:00 am	Opening of Exhibition and Coffee	
	Registration		9:15 - 10:00 am	VG Support: Insights from the Inside	Support Team
	Hands-on Sessions I				Volume Graphics GmbH
10:30 - 11:10 am	Keynote	Christof Reinhart	10:00 - 10:30 am	Coffee Break	
		Volume Graphics GmbH	10:30 - 11:30 am	Hands-on Sessions III / Exhibition	
11:10 - 11:30 am	Coffee Break		10:30 - 10:45 am	Partner Presentation: Malvern PANalytical B.V.	
11:30 am - 12:00 pr	n Inline CT and Analysis of up to 3,600 Parts per Hour	Gerd-Hendrik Greiwe, Dinu Tandarean	10:45 - 11:00 am	Partner Presentation: GE Sensing & Inspection Technologies GmbH	
		xray-lab GmbH & Co. KG	11:00 - 11:15 am	Partner Presentation: FARO Europe GmbH & Co. KG	
12:00 - 12:20 pm	Remark Reginanting of Collular Structure Uping Additive Manufacturing	Anton du Plessis	1 1:15 – 11:30 am	Partner Presentation: diondo GmbH	
12.00 = 12.30 pm	bit in the Edgineering of Cenular Structure Using Adultive Manufacturing	Steller losch University	11:30 am <u>- 12:</u> 00 p	m Validation of Failure of Long Fiber Thermoplastics by Digima. Analysis Coupled to Micro Computer Tomograpi	hy Sebastian Krämer
12:30 – 2:00 pm	Lunch			IIr Nhdakarci	Brose Fahrzeugteile GmbH & Co. KG
2:00 - 2:30 pm	Strate ing the limit of Partner Computer Tanagraphy	Jens Feter Steffen	12:00 – 2:30 n	Mining Lixels & Textured Mennes; The Norfect Collibination	Benjamin Moreno
2.00 2.00 pm	Stretc ng the unnit on the focu con site not sgraphy	X-RAY WorX GmbH	•		IMA Solutions
2:30 - 3:00 pm	Mold Cavity Correction	Holger Ostroske	12:30 - 12:45 pm	Farewell	Christof Reinhart
		TE Connectivity Germany GmbH			Volume Graphics GmbH
3:00 – 3:20 pm	Coffee Break		12:45 – 2:15 pm	Lunch	
3:20 - 3:50 pm	Examples of Linear Accelerator CT using the Reconstruction Tools of Volume Graphics	Andrew Good	2:15 pm	End of Event	
0.20 0.00 pm	Examples of Encal Models and of ading the neocholitation roots of volume orapina.	Jesse Garant & Associates	2-20 - 2-20 pm	Bonus Session	Sven Gondrom-Linke
3:50 - 5:20 pm	Hands-on Sessions II / Exhibition		2.00 - 0.00 pm	Scan & Reco: Tips & Tricks for Getting It Right	Volume Graphics GmbH
3:50 – 4:05 pm	Partner Presentation: YXLON International GmbH				
4:05 – 4:20 pm	Partner Presentation: VisiConsult GmbH				
4:20 – 4:35 pm	Partner Presentation: SHR Shake H. GmbH				
4:35 - 4:50 pm	Partner Presentation: RJL Micro & Analytic GmbH				

- 4:50 5:05 pm Partner Presentation: North Star Imaging Europe
- 5:05 5:20 pm Partner Presentation: Nikon Metrology GmbH
- 5:20 pm End of Day 1
- 7:00 pm Evening Event



Exhibiting Partners UGM 2017









20 Years Volume Graphics

20 Years Voxels



The Years Before Volume Graphics

November 1992 – April 1997



VIRIM

In 1995 the world wide first real time volume rendering hardware able to render 32 MB of data at ~20 fps.







Foundation Volume Graphics GmbH

April 29th 1997



No garage but not that much more.





20 Years Volume Graphics

What has changed?



Office Location

1997 - University Mannheim



2017 – Headquarter in Heidelberg





Software Products

VGInsight 2.0



VGSTUDIO MAX 3.1





Product Offerings - Web-Site

1997

Author: Christof Reinhart, last updated: June 5, 1997



2017



Data Sets

1997 – 256 Voxel³ 32 MB



Human heart fly through - 1998

2017 – 2 stacked 4k detector scans... >200 GB



Video camera at 0.049 mm voxel size - CT scan by GE



Events

2004 - DGZfP ~ 30 attendees



2016 - UGM ~ 160 attendees





20 Years Volume Graphics

Some "Things" never change!

The Founders!







The Founders!

Not the slightest difference, don't you think?





Release Cycles

Something that does change.



Product Release Cycles

- > 2015 we introduced SCRUM as our new software development process.
- > One major goal behind that change was to offer product updates in shorter time.
- > Release cycle time from VGInsight 2.0 to VGSTUDIO MAX 3.1



Product Release 3.1

Available for download in September 2017.





Product Release 3.1

What's New?

A rough overview.





Bigger, Better, Faster, Stronger

> Release 3.1 comes with numerous improvements requested by our customers.





Bigger, Better, Faster, Stronger

- > Release 3.1 comes with numerous improvements requested by our customers.
- > It takes care of several common market trends like:
 - > more voxels / larger data sets
 - > more pixels / high-res monitors
 - > more GPU Power
 - > more CPU Power
 - > more I/O Performance SSD drives
 - > ...





Bigger Data

- > To read data sets like this video camera scan with more than 200 GB in size it would take:
 - > more than 20 min on a regular hard drive
 - > more than 6 min on a regular SSD
 - > about 2:30 min on a high end SSD





Bigger Data

- > To read data sets like this video camera scan with more than 200 GB in size it would take:
 - > more than 20 min on a regular hard drive
 - > more than 6 min on a regular SSD
 - > about 2:30 min on a high end SSD
- > We already improved the raw volume import performance in release 3.0, now we improved it for the image stack import.
- > To optimize the I/O performance for your system adjust the thread count in the Expert section of the application preferences.





High-Resolution Monitor Support

Optimized text size, icon size can be adjusted by the user.





Release 3.1 Comes With macOS Support

Example: VGStudio MAX 3.1 on an 5K retina display iMAC under macOS Sierra 10.12.6.





New Improved Mesh & Point Cloud Import

Z X

- > Improved meshing.
- > Native FARO point cloud import.
- > Support for obj and ply meshes with vertex colors and textures.
- > ASCII point clouds with colors support, e.g. from optical scanning devices.

> Please join Mr. Moreno's exciting presentation tomorrow for details.





Segmentation Tools Enhancements

- > ROI from all geometry element types, e.g. planes.
- > Enveloping Region of Interest (ROI) with user defined ROI thickness, e.g. for the specific analysis of near-surface properties.
- > Draw ROI with grey value interval.
- > Enhanced histogram segmentation tool.
- > Numerically define ROI dimensions and positions.

> ...

> Please join our support team presentation for more details or visit our demo stations.





New Non-Local-Means Filter





New Non-Local-Means Filter

- > Denosing filter with greater post-filtering clarity, and less loss of detail.
- > Ideal for pre-processing before segmentation tasks on noisy data.
- > Highly computational intense algorithm.
 VG implemented this filter with GPU / multi-GPU support to speed up calculation performance.





New Gray Value Analysis Module

- > The former Volume Analyzer has been upgraded to a full featured Grey Value Analysis tool.
- > It comes with full tolerancing and reporting capabilities and can be used in automated inspection like every analysis module.
- > The Gray Value Analysis Module comes as part of a VGSTUDIO MAX base license.

🗑 Properties of Gray value analysis: Analysis 1 of Region 4 of Volume 2 – 🗆 🗙												
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Tolerance settings												
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Maximum gray value		n/a					100.0				00.0	
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New Gray Value Analysis Module

> Allows to tolerate:

- > Standard deviation
- > Min / MAX grey value
- > Hotspot Min / Max grey value density
- > Hotspot volume
- > Number of Hotspots

> ...

- > Slice based analysis (e.g. for inspection of additive manufacturing parts)
 - > Standard deviation per slice (grey value)
 - > Mean grey value per slice





New Gray Value Analysis Module

- > A simple application example: Test for the presence of components on a printed circuit board.
 - > Create an inspection ROI
 - > Create a Gray Value Analysis on this ROI
 - > Check if the mean grey value in the ROI is within a defined interval.
 - > The scene tree will finally display the inspection status.





Metrology

- > Element recognition & Smart Expand: Automatically recognize and fit geometry elements with a single mouse click.
- > Automated generation of datum systems (ISO 5459 conformant)
- > Creation of common datums
- > Torus geometry element.
- > Auto Expand Options: Disk or Square
- > Customizable Extraction of Medial Axis
- > Enhanced Coordinate System Editor

> ...

> Please join our support team presentation for more details or visit our demo stations.





New VGEasyPore Porosity/Inclusion Analysis

- > Generates excellent results faster thanks to simple parameterization and shorter calculation time.
- > Also available in the enhanced porosity/inclusion analysis according to VDG P 202.





New Wall-Thickness Analysis (WTA)

Classical WTA using ray method

> Ray method:

Searches for the shortest distance between two parallel surfaces.







New Wall-Thickness Analysis (WTA)

New WTA using sphere method

> Sphere method:

Searches for the largest inscribed sphere that fits between two opposite surfaces.







New Wall-Thickness Analysis (WTA)

- > The sphere method always gives a result across the entire object (as opposed to the ray method)
- > More suitable for irregular, bionically optimized structures, e.g. as shown here when used on the 3D printed Airbus cabin bracket.





Structural Mechanics Cluster Extension

Faster structural mechanics simulation by distributed computing

- > Available for our Structural Mechanics Simulation add-on module in 2 options for:
 - > up to 4 or
 - > up to 16 network computers.
- Enables faster processing as well as handling larger projects that require more overall system memory.



CT Reconstruction

Improvements:

 Improved GPU / multi GPU support. Up to 25% faster.

> Improved metal artifact reduction (MAR & sMARt) performance. Up to 35% faster

> Several GUI enhancements, e.g. Wizard-Tabs.





CT Reconstruction

 Improved reconstruction image quality for filtered back projection based Helical CT Reconstruction.





Manufacturing Geometry Correction (available in 2017)

> With the Manufacturing Geometry Correction Module, you can correct the geometry of the tool, mold or the part itself based on deviations of the scanned part from the target model.



> For more details please joinMr. Ostroske's presentation today.

VGinLINE

Release 3.1

- > The new VGinLINE release comes with all improvements of our VGSTUDIO MAX product line.
- > It now supports direct processing of point cloud and mesh data e.g. from optical scanning devices.
- > Comes with multi-language support (EN, JP).

For more detailed information and demonstration please visit our VGinLINE demo station in the exhibition space.





VGinLINE APPROVER (available in 2017)

- > Enables the user to review and revaluate the automatically generated inspection results.
- > Comes with user authentication for full traceability.
- > Analysis results and user revaluations are stored and managed in a database e.g. for documentation purposes.





VGinLINE APPROVER (available in 2017)

- > Enables the user to review and revaluate the automatically generated inspection results.
- > Comes with user authentication for full traceability.
- > Analysis results and user revaluations are stored and managed in a database e.g. for documentation purposes.
- > Database content can be used for statistical analysis. Example shows the amount of porosity in aluminum castings during manufacturing ramp-up.





20 Years Volume Graphics

Something that never changed!

Volume Graphics' Personal Claim





We want to offer our customers the best in class solutions.



Thank you