Hands-on Training Courses

Learn What Is Possible with Software Virtuallab Fusion

Dates and Topics:

19 – 20 May 2025 | Introduction to VirtualLab Fusion

22 – 23 May 2025 | Optical Modeling & Design for Augmented and Mixed Reality with VirtualLab Fusion

Note: It is possible to register for either of the two parts of the course, as well as for both of them together.

Location:

LightTrans USA L.P.

5126 South Royal Atlanta Dr

Tucker GA 30084, United States of America

First Some Basic Information about VirtualLab Fusion (VLF)

It's often the software that comes before the hardware! First, test, check, analyze, investigate, design and optimize, then fabricate and construct. This is the typical workflow. But which software is best suited for one's purpose?

Due to its unique software architecture, based on a groundbreaking theoretical foundation, VLF lends itself to almost unlimited use for many optical simulations. Especially because we have focused on the most important aspects for our customers.

Navigating the delicate compromise between the accuracy of the results and the speed with which those results can be generated is an unavoidable part of simulation technology. The optical modeling and design software VLF provides its users with the necessary flexibility and control to strike the right balance between accuracy and speed every time, through its interoperability of modeling techniques on a single platform.

Be Inspired by the Enormous Range of Capabilities and Possible Applications of VLF:

- From nano to macro scale.
- Modeling of any existing light source - from X-rays to microwaves and beyond.
- You can consider diffraction, coherence, interference, and polarization, as well as energy conservation.
- Use tailor-made modeling options for all kinds of optical scenarios.
- Customizable evaluation tools.

- **Interferometry**
- **Fibre Coupling**
- **Meta Gratings**
- **Micro Lens Systems**
- **Ultrashort Pulses**
- **Complex Meta Structures**
- **A**nisotropic Media and Birefringence
- **Light Diffusing, Splitting and Shaping**
- **Augmented and Mixed Reality Waveguides**

Its intuitive and attractive graphical user interface, online assistant and globally valued support service make it the obvious choice.

Software Training

Introduction to VirtualLab Fusion

Date:
19 – 20 May 2025

Location:
LightTrans USA L.P., Tucker GA

This course is perfect for anyone and everyone, from absolute beginners to advanced users. If you want to practice or expand your use of the new simulation concept "General Profile" or refresh your skills and learn a new functionality or two, this is the course for you!

You'll gain the necessary knowledge to perform a variety of optical simulations through a selection of various use cases, which illustrate the wide range of application areas.

Topics:

- Building your first optical system with VirtualLab Fusion.

- System building blocks. Simulation settings. Key aspects of VirtualLab Fusion technology.

- Light as an electromagnetic field. Detector add-ons, our flexible detector modeling.

- Striking the correct accuracy-speed balance through interoperability of modeling techniques on a single software platform.

- The role and control of the Fourier transform in the simulation of diffraction. The catalog of algorithms for the calculation of the Fourier transform.

- Behind the scenes: palette of algorithms used, depending on selected optical elements (electromagnetic field solvers).

- Non-sequential simulations. The Light Path Finder. The channel concepts.

- Advanced Source modeling – the source mode concept.

- Convenience tools (handling of 1D and 2D data, multigraphs, cross sections generation, parameter sweeps, parametric optimization, property browser, ...).

- Hands-on "playing": During the course different simple and more complex systems will be used, introducing different topics/options/aspects (etalon, interferometer, ghost images, waver inspection, ...)

- Q & A
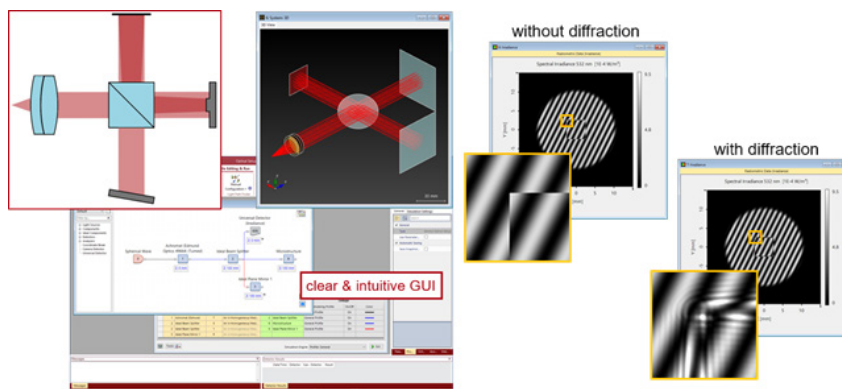
Please note that this agenda remains subject to change. The topics discussed as well as the order in which they are presented can be adjusted on the spot before or during the course, according to the dynamics of the group.

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Software Training

Optical Modeling & Design for Augmented and Mixed Reality with VirtualLab Fusion

Date:
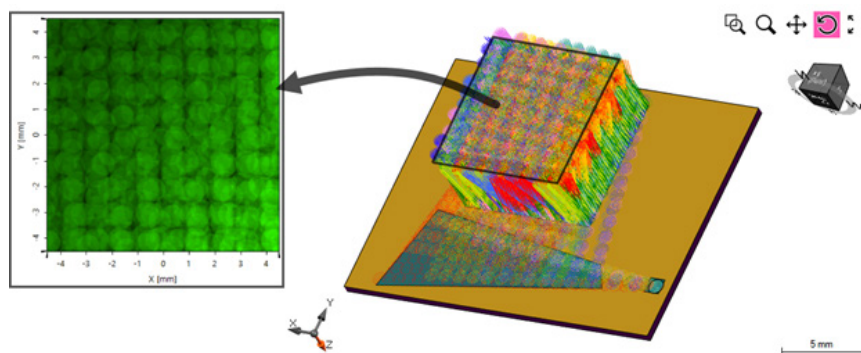22 – 23 May 2025

Location:
LightTrans USA L.P., Tucker GA

This course is intended for people who are already familiar with the basic usage of VirtualLab Fusion (VLF) (e.g., as taught in the introductory course), so that we focus on the more specific lightguide topics.

First, the base concept for grating modeling is covered, followed by introducing the concept and tools for modeling, simulating and designing for AR/MR applications, using grating based lightguides. Here, VLF shows its full strength by providing, on a single software platform, rigorous modeling techniques for gratings alongside a rich catalog of numerical methods for other types of components. We show how to control a balance between accuracy and speed in VLF and adjust it as required. VLF takes into account complex physical effects (interference, coherence, polarization, diffraction...) that all interact in AR/MR lightguides and influence the final performance of the device.

Topics:

- Grating configuration and modeling - The grating specific optical setup.
- Convenience tools for grating analysis.
- Fourier modal method (FMM) also known as rigorous coupled wave analysis (RCWA).
- Parametric optimization.
- Configuration of lightguide systems for AR & MR applications with grating couplers.
- Idealized versus real gratings.
- Modeling of different lightguide geometries.
- Layout design tool (for 1D-1D pupil expansion)
- Footprint and grating analysis tool (valid for all layouts)
- Introducing grating regions that exhibit smoothly varying grating parameters
- Q & A

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