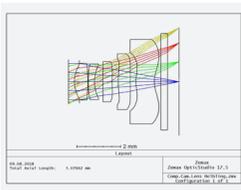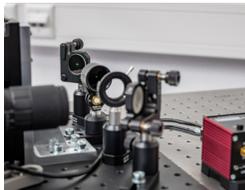# Optics, Embedded Vision and Sensor systems

Our service portfolio:

Optical Design and Calculations

Laser systems & beam shaping

Low-cost Sensor Systems & Modules

Optical Devices

Embedded Vision & Single-Board Computer

Image enhancement & ISP tuning

Camera & Camera Modules: Evaluation & Development

AI and computer vision algorithms

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Innovation together we do it

Founded in 1963, the Helbling Group operates inter-nationally and combines engineering and consulting expertise. The Helbling Group is managed by 37 Partners and employs over 630 people at locations in Switzerland, Germany, Poland, the USA and China. The Helbling Group focuses on providing selected services in the areas of innovation and product development, management consulting, mergers & acquisitions, business turnarounds and financial performance management, IT, real estate and construction planning.

Helbling Technik is a division of the Helbling Group and currently employs over 500 professionals. Our vision "Innovation, together we do it" positions Helbling Technik as a trusted long-term partner within its clients' innovation network. Helbling Technik's highly qualified engineers, computer scientists, physicists and human factors experts use state-of-the-art development tools, processes, laboratories and tools to develop innovative and successful products and support clients around the world from idea to market launch.

Kontakt

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Tailored Tuning of Image Signal Processors

Boosting the image quality of low-cost cameras to the next level by tuning of image signal processors (ISP-tuning).
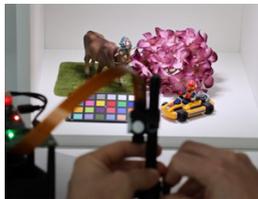

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Maximizing Hardware potential and cost-efficiency

Helbling enables high-quality imaging on low-cost hardware through expert ISP tuning. By leveraging a comprehensive data library of high-end camera analysis, Helbling optimizes image parameters to enhance visual appeal — achieving customized and unique styles of image reproduction. With individual consulting and systematic optimization, Helbling ensures superior image quality at minimal hardware costs.

Typical applications of ISP-tuning include:
- Enhanced image quality for consumer products (video streaming / recording)
- Low-light applications
- Industrial inspection and monitoring
- Surveillance applications
- Improved image quality for AI applications

Optimization of image quality of a 4 € low-cost camera module to the level of an iPhone 15 Pro.

ISP-tuning for a camera system for pipe inspection

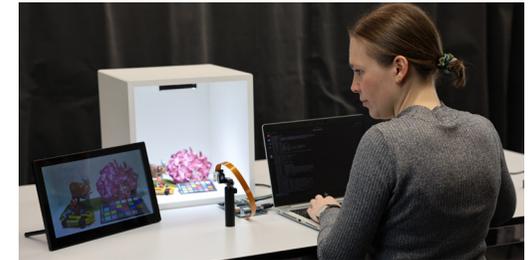## Excellent color reproduction and scenario-based adjustments

Your advantages:
- Premium image quality with low-cost hardware: Helbling optimizes ISP settings to achieve high-end visual results, even with low-cost camera modules.
- Manufacturer-independent optimization: The tuning process is adaptable to various camera modules and processors, ensuring broad compatibility.
- Quantifiable improvements: Image quality enhancements are measurable and verified according to international ISO standards.
- Depending on the hardware, parameters such as black level correction, color reproduction, lens distortion, etc. can be optimized.

Camera test stand for evaluation of color reproduction according to ISO 17321.

Helbling perfects implementation of an innovative technology

Additional services complete the portfolio of Helbling:
- Measurement and evaluation of image quality of cameras in the laboratory.
- Development of tailored single-board computer for embedded vision applications.
- Customized image processing algorithms for embedded systems with OpenCV and TensorFlow.
- Evaluation & sourcing of low-cost cameras in Asia.

At Helbling, all developments follow an established development process:
- Analysis of the task.
- Definition of requirements.
- Development, implementation, optimization and verification.
- Industrialization.
- Support of market introduction and lifecycle management.
- Helbling is ISO9001/ ISO13485 certified.