EYESI SLIT LAMP
Training simulator for eye examinations

Look closer. See further.

HAAG-STREIT SIMULATION

Eyesi Slit Lamp
High-end virtual reality simulator for training of eye examinations

Eyesi Slit Lamp is a virtual reality simulator for training of eye examinations. Using the embedded curriculum, trainee ophthalmologists and optometrists can practice both the complex handling of a slit lamp and recognition of relevant clinical manifestations – independent from patient flow and hospital routine. The practical training on the simulator is complemented by introductory online couses on the VRmNet web portal.

ALL FUNCTIONS OF A REAL SLIT LAMP

Lifelike operation

Eyesi Slit Lamp offers a lifelike training environment and a highly realistic simulation of the visualization of intraocular structures in real-time. High-end virtual reality technology is integrated into the original hardware of the Haag-Streit BQ 900 slit lamp. Eyesi Slit Lamp simulates all functions of the real slit lamp. Trainees can examine virtual patients with the biomicroscope, fundoscopy lens, or gonioscopy lens*.

PROCEDURAL AND DIAGNOSTIC TRAINING

Expertise comes from experience

Eyesi Slit Lamp allows trainees to become acquainted with the complex examination modes of a slit lamp and provides them with medical knowledge and experience to reliably identify pathological findings. The simulator's database contains a range of virtual patients, which are based on real patient cases and have been modeled in close cooperation with university eye clinics. With a didactically structured curriculum for self-guided training and objective assessment and feedback, Eyesi Slit Lamp enables trainees to become experienced before they examine their first real patient.

Lifelike training environment

Eyesi Slit Lamp simulates all functions of a real slit lamp. High-end virtual reality technology is integrated into the original hardware of the Haag-Streit BQ 900 slit lamp. The highly realistic simulation of the visualization of intraocular structures in real-time provides for a highly immersive training environment.

Standardized curriculum for self-guided learning

The simulator's didactically structured curriculum offers training at different levels of difficulty, leading trainees step-by-step to expert performance. While beginners' courses focus on slit lamp handling and illumination techniques, the advanced courses introduce a wide range of clinical pictures and standard grading systems.

Evidence-based assessment

Eyesi Slit Lamp provides both trainees and educators with an objective performance assessment. Guidance elements and immediate feedback after each case help trainees to improve their skills systematically.

Eyesi Slit Lamp
Lifelike training environment

A slit lamp offers a range of settings and degrees of freedom, such as rotation and three-axis position of illumination and microscope arm, slit width and length, or filters. Eyesi Slit Lamp provides exactly the same controls as the Haag-Streit BQ 900 slit lamp, making the transition to a real slit lamp for trainees as easy as it can be.

HIGH-END VIRTUAL REALITY

Immersive training experience

Trainees can examine virtual patients of different age and ethnicity and with diverse ophthalmological conditions. As they look into the simulator's microscope, they see the visualization of anatomical structures of the eye. All optical effects of a slit lamp are reproduced in real-time.

PRECISE MECHANICS AND OPTICS

Microscope and illumination arm

The Eyesi Slit Lamp comes with a microscope featuring mechanical and optical systems from Haag-Streit. With its two high-definition displays, the microscope offers a precise stereo visualization of the virtual slit lamp examination. Built-in sensors detect the slightest movement of the microscope and illumination arm and the position of the slit lamp controls. Trainees learn to use appropriate illumination techniques, such as direct focal illumination, retroillumination, sclerotic scatter, or the Van Herick technique.

STEREO MICROSCOPE

RETINAL EXAMINATIONS

Fundoscopy lens

Trainees can practice examinations of the posterior segment using a 90D ophthalmoscopy lens mimic in combination with a patient model head. For the visualization of the retina, they need to insert the 90D lens into the virtual slit beam and then move it slowly towards the patient model eye until they see a focused image through the slit lamp microscope.


FUNDOSCOPY LENS

CHAMBER ANGLE EXAMINATIONS

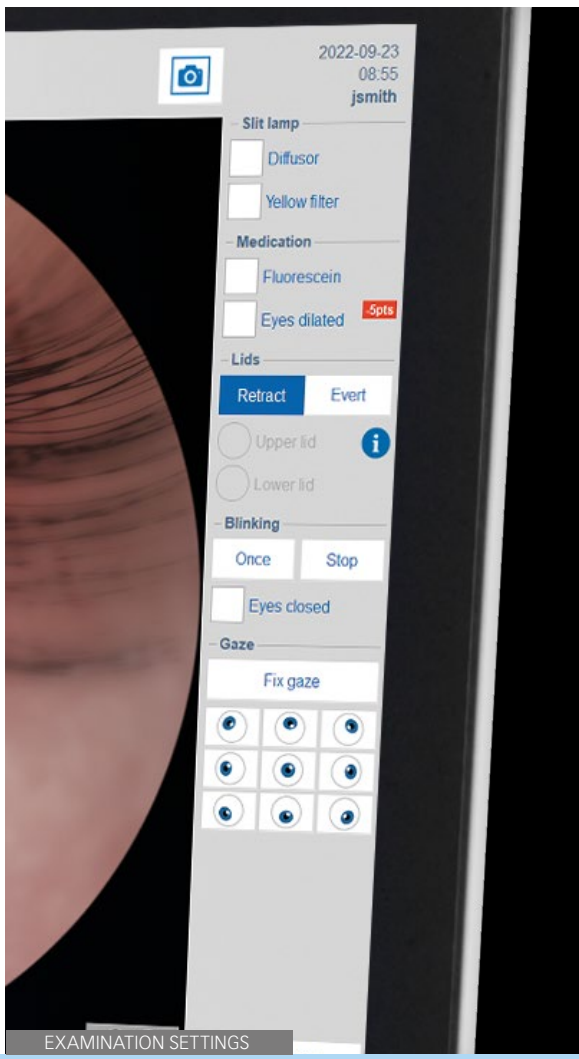
Gonioscopy lens

For examinations of the anterior chamber angle, an indirect gonioscopy lens mimic is available. To examine the angle structures, trainees must position the lens mimic on the eye of the patient model head. The Eyesi Slit Lamp training system detects the exact position and angle of the gonioscopy lens and visualizes the chamber angle accordingly.

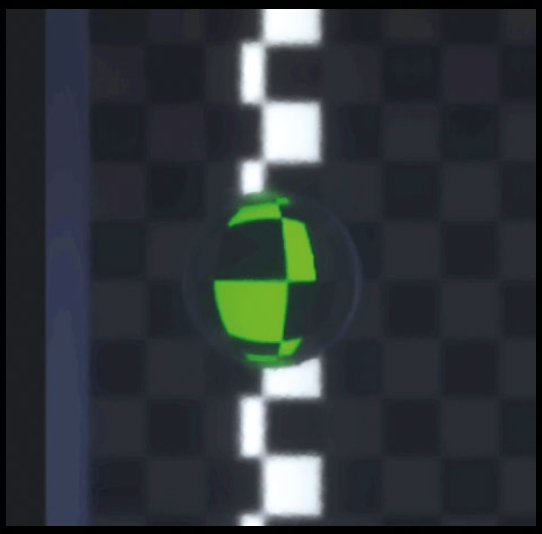
PATIENT'S EYES

Examination settings

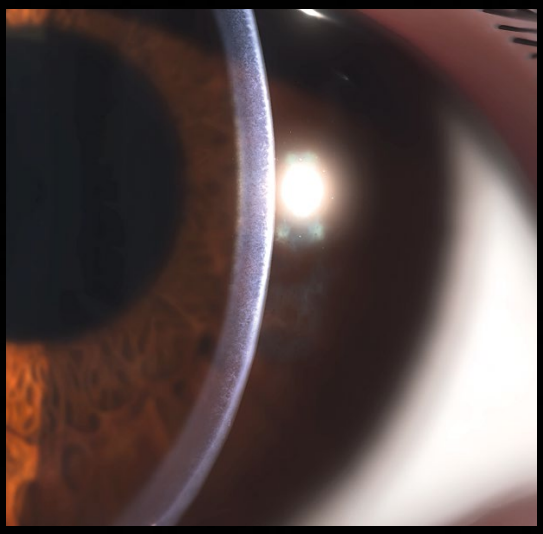
On the Eyesi Slit Lamp touch screen interface, trainees can control the examination settings. A diffusor can be activated for observation under diffuse illumination, fluorescein can be applied, and the eyes may be dilated to facilitate lens or retinal examinations. The virtual patients can be set to keep their eyes closed, blink or stop blinking, fix their gaze, or look in a specific direction. Trainees can evert the patient's eyelids by touching corresponding sensor fields on the patient model head.



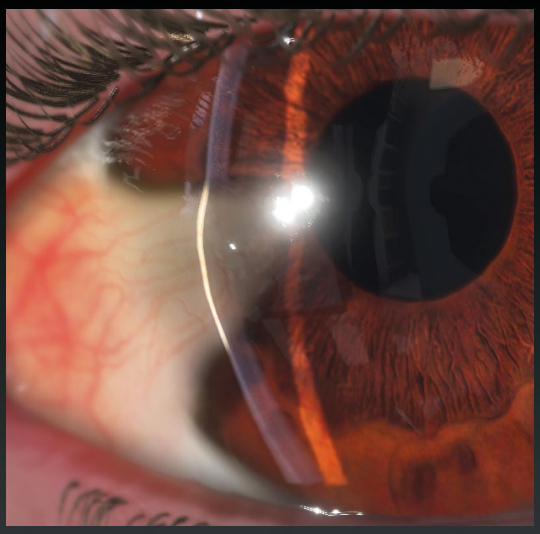
EXAMINATION SETTINGS



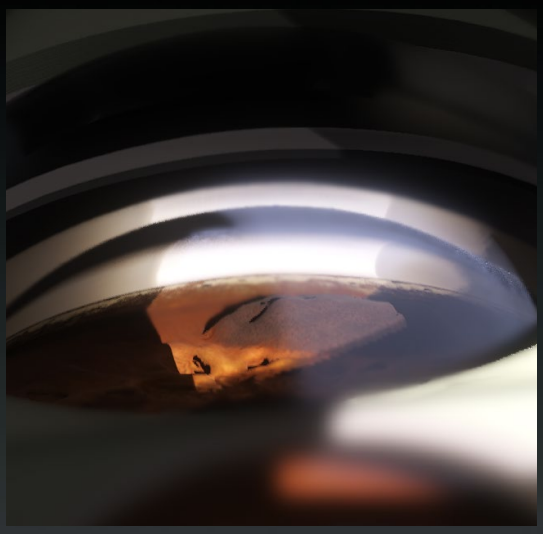
TIER A2: REFRACTION SHOWN WITH RETROILLUMINATION



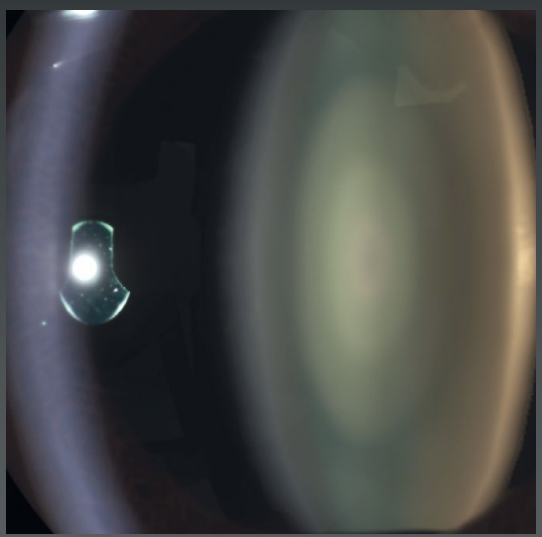
TIER B: OPTICAL SECTION THROUGH HEALTHY CORNEA



TIER C1: NARROW SLIT SHOWS ELEVATION OF PTERYGIUM



TIER C1: IRIS MELANOMA IN GONIOSCOPIC EXAMINATION



TIER C2: GRADING OF NUCLEAR CATARACTS

TIER D: HEMORRHAGES IN BRANCH RETINAL VEIN OCCLUSION

Embedded curriculum
Didactically structured courses

Training with Eyesi Slit Lamp allows for a standardized learning experience and ensures that all students reach the same level of clinical proficiency. Featuring an embedded courseware, the simulator can easily be integrated into ophthalmology or optometry programs.

STANDARDIZED CURRICULUM

Ready-to-go courseware

Eyesi Slit Lamp comes with a didactically structured curriculum, which has been designed to lead trainees step-by-step to expert performance. Students advance through the curriculum independently and self-guided. Educators can lock or unlock courses as required.

CASE-BASED APPROACH

Database of virtual patients

The Eyesi Slit Lamp curriculum uses a case-based approach to teach diagnostic skills. In order to teach slit lamp handling and illumination techniques, the courseware starts with abstract scenarios. After they have learned to visualize anatomical features of healthy eyes, trainees get to know ocular pathologies and commonly used grading schemes, for example, for cataracts. Finally, clinical cases with detailed patient histories support trainees in developing diagnostic skills. The Eyesi Slit Lamp case database contains a wide range of clinically relevant pathologies, ranging from infections of the eyelids to diseases of the chorioretinal complex.

OVERVIEW

Eyesi Slit Lamp courseware

Tier A1: Device handling
Trainees get to know all functions of the slit lamp, for example, control lever and rotation arms. Further, basic handling courses teach how to use the fundoscopy and gonioscopy lenses with the slit lamp.

Tier A2: Illumination techniques
This tier introduces the optical phenomena of reflection, refraction, scattering, and absorption and teaches how to use them on the slit lamp to visualize ocular structures.

Tier B: The healthy eye
By examining healthy eyes of patients of different gender, age, and ethnicity, trainees learn to visualize anatomical features and get familiar with variations of normal eyes.

Tier C1: Findings and diagnoses
Virtual patients present with pathologies of the anterior and posterior segment. Students learn to recognize typical signs and symptoms of specific pathologies. The simulator guides trainees through the examination.

Tier C2: Grading and classification
In tier C2, standard grading and classification schemes are introduced. Trainees practice the detailed assessment of diagnostic findings and learn to estimate and classify the severity of findings.

Tier D: Clinical cases
The clinical cases are based on real patient cases and help trainees develop clinical skills such as making diagnoses, differential diagnoses, and therapy.

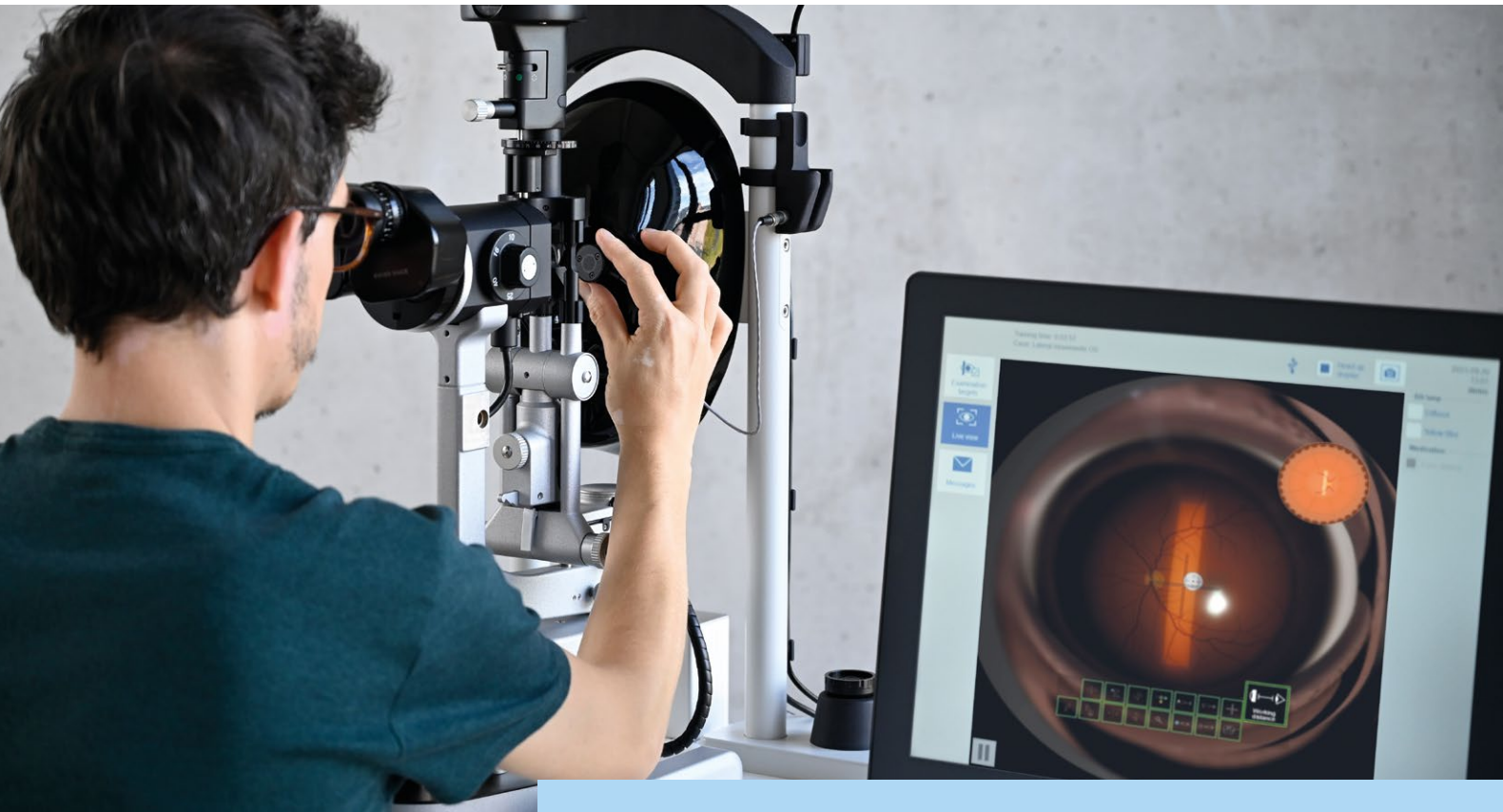
Feedback and assessment
Systematic improvement of skills

Eyesi Slit Lamp offers an interactive training environment that provides trainees with immediate feedback on their performance. Educational guidance elements support beginners in their learning process. Additional medical background information helps to deepen the understanding of anatomical and pathological characteristics.

PERFORMANCE MONITORING

Training reports

After each case, Eyesi Slit Lamp presents trainees with a detailed performance summary. The training system records various parameters relating to procedural and diagnostic abilities. The detailed evaluation allows trainees to improve their skills systematically. By providing comprehensive training reports, Eyesi Slit Lamp also allows educators to assess their trainees' skill acquisition.



EDUCATIONAL SUPPORT

Guidance elements

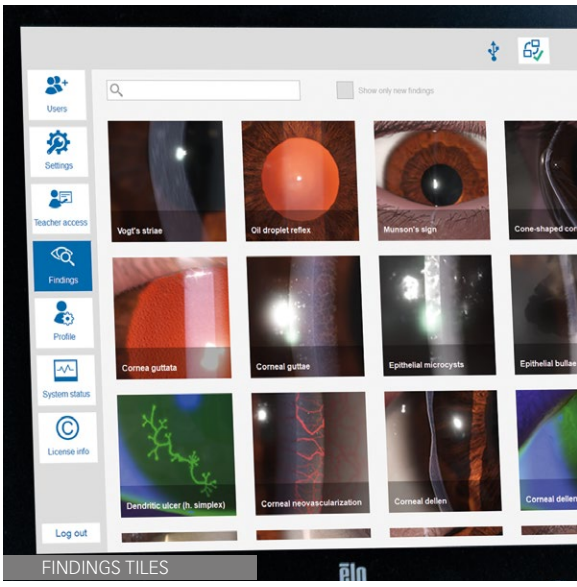
Eyesi Slit Lamp features visual and auditive guidance to support beginners in their learning process, for example, by highlighting anatomical or pathological findings. Because the slit lamp is a complex tool with many degrees of freedom, users are provided with an overview of correct and incorrect slit lamp settings to achieve a given examination target. Only if all slit lamp settings are correct is the pathological finding highlighted in the microscope, accompanied by a “bing” sound.

GUIDANCE: HIGHLIGHTED FINDINGS

MEDICAL BACKGROUND

Findings tiles

Each time a trainee detects a pathological finding, it is highlighted and a findings tile appears on the touch screen providing medical background information. All detected findings are stored in the trainee’s personal findings library, which is also accessible on the VRmNet web portal. Trainees can use the findings menu on the simulator to start cases associated with the specific finding.



FINDINGS TILES

DIAGNOSTIC TRAINING

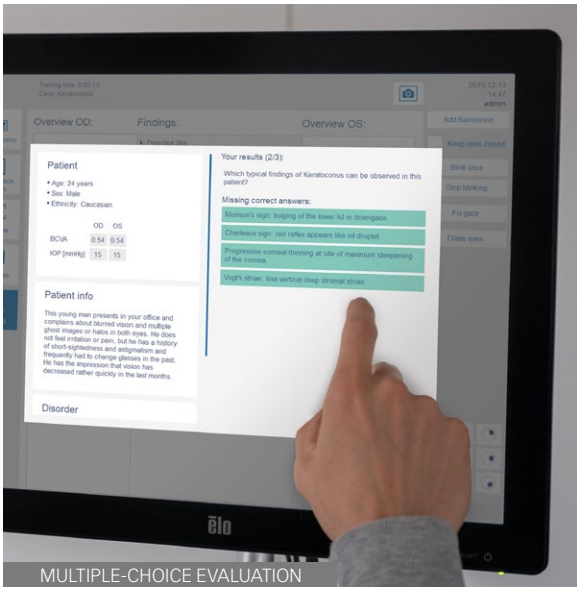
Multiple-choice forms

In the clinical cases, trainees have to find pathological signs without guidance and specify their findings and diagnoses in multiple-choice forms. Their results are immediately evaluated by the training system.

PERFORMANCE ASSESSMENT

Detailed evaluation

At the end of each examination, trainees are presented with a detailed evaluation of their examination and diagnostic performance. Scored parameters include the examination time, the light exposure, the completeness of findings and accuracy of the diagnosis. Both trainees and educators also have access to the accumulated training data on the VRmNet web portal.



MULTIPLE-CHOICE EVALUATION

VRmNet
Web portal for networked simulators

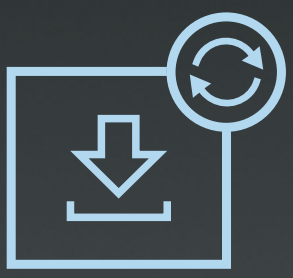
VRmNet is a web-based service available for networked medical training simulators from Haag-Streit Simulation. The web portal offers online features for both trainees and educators. Users can access their personalized VRmNet dashboard from any computer or mobile device 24/7.

EASY ADMINISTRATION

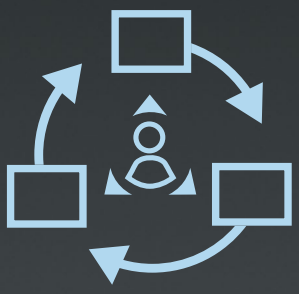
Teaching large classes efficiently

Educators can use VRmNet to comfortably set up users and manage courses. Configurable notifications and reports keep teachers informed on their classes' training status. Trainees log in to VRmNet to access their training data, medical online courses and their findings library for recap of learning content. To prepare trainees for their first training session, VRmNet provides an online orientation with short videos on simulator usage.

Benefits for Operation and Service



Automatic Updates



Optimized Allocation

Online Service

Online courses for trainees

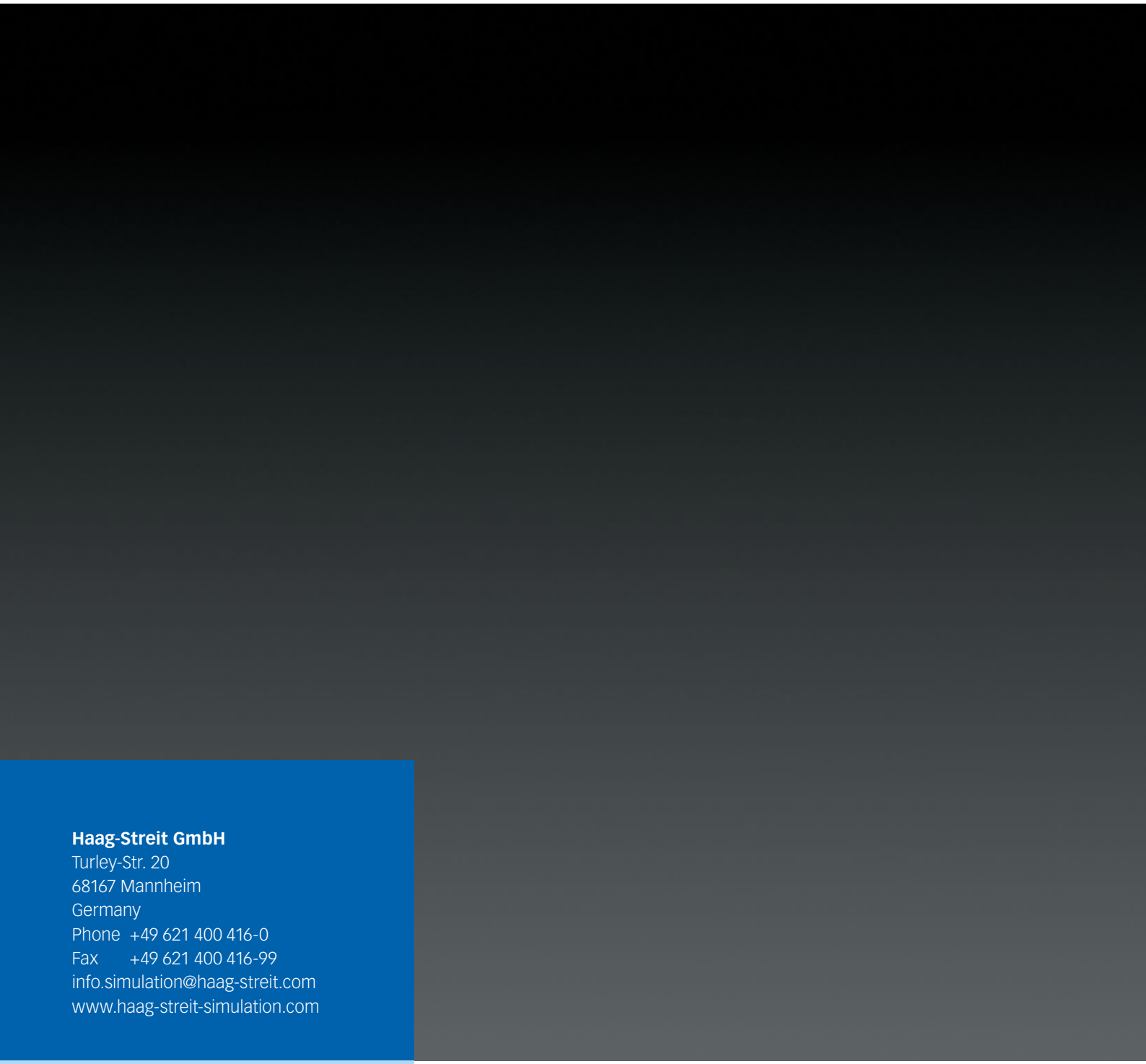
VRmNet features online medical courses which are intertwinded with the training curriculum on the simulator. The complementary courses are enriched with videos, images, and multiple-choice tests.

Administration tools

Educators can use VRmNet to comfortably set up users, manage courses, and analyse their residents training data down to the last detail.

Automatic software updates

All simulators connected to VRmNet receive the latest software updates automatically. Customers profit from data back-ups and synchronization as well as easily operated service through the VRmNet networking access.



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