General comments

The presented system partially complies with the basic requirements specified by in the experiment description.

The mechanical setup consists of an industrial manipulator to which the end-effector (a positioning mechanism holding the camera) is mounted that was developed by the consortium. The latter is in an early experimental state. In the current state, the end-effector is connected via optical fiber to the actual laser source. It is anticipated that a smaller solid state laser can be integrated directly in the end-effector.

The vision system can detect the cornea cut under restrictive conditions on the lightening and the cornea. The system seems not be able to robustly detect the cornea cut.

Once the cornea is detected the system can follow the desired path. The vertical alignment is maintained by fixing the robotic manipulator (which puts into question the use of an industrial robotic manipulator).

Dangerous scenarios where the temperature exceeds a specified value are mitigated by monitoring the temperature with the NIR camera. There seems not be a problematic latency.

While the demonstrator is able to perform the test scenario on a surrogate cornea (glass ball with perfectly visible cut), the TRL of the demonstrated solution is low. The demonstrator seems not be applicable to further research as it would be expected from a successful experiment. It is clear (and should have been before the project started) that the proposed system will have no chance to enter the market within the next decade simply because of the certification requirements and the fact the surgical technique itself, which is to robotized here, is not established yet.

Recommendation

The project's goal has been achieved only partially. This is due to the difficulty of the addressed problem on the one hand. On the other hand some of the shortcomings (e.g. vision system, cornea detection) could have been alleviated by timely action of the consortium.

It is recommended to withhold the final payment until it can be demonstrated that system works well for pig eyes under clinical lighting conditions.