

**Diploma thesis abstract**

**“Human eye aberrations measurement and reproduction”**

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**The present work is devoted to accuracy improvement of Shack-Hartmann method for measuring human eye aberrations. Based on aberrations measurement accuracy analysis it has been suggested to include the algorithm eliminating systematic errors in the current technique. Such errors are due to measured intensity nonuniformity. For more accurate calibration of devices for measuring human eye aberrations the novel aberrations imitator has been proposed. The imitator is based on semipassive bimorph flexible mirror and can either reproduce eye aberrations with high accuracy in real time (both lower and high order) or simulate different accommodation states. The Shack-Hartmann method has been further developed by introducing the technique capable to determine intraocular optical elements location. To use the method directly for eye aberrations measurements the novel theory for determining human eye optical elements location has been evolved for point sources case. The technique has been verified on the personalized eye model and the Gullstrand model as well.**