



Ravil Idrisov, Dr. rer. nat.

Optical Engineer specializing in optical systems, sensors, interferometers, and lasers. Expert in fiber and free-space optics, high-power lasers, optical simulations, data processing, programming, and hardware control. Brought multiple optical sensors from a concept to a mature prototype.

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Optical Engineer [3.25-now] Airmo GmbH Berlin, Germany	• Systems engineering for a satellite optical payload • Spaceborne spectrometer optical design, alignment, performance analysis, CalVal • Space- and airborne LIDAR construction, co-alignment, and integration • TDLAS sensor design and optimization for methane concentration measurement
R&D Engineer [3.22-4.25] Fusion Bionic GmbH Dresden, Germany	• Designed an upscaling technology - currently being developed through two concepts proposed by me. • Conducted feasibility studies to ensure the technology's effectiveness for a specific material and functionality. • My work involved utilizing high-power ps- and nanosecond lasers and programming hardware to control high precision stages, signal generators, and measurement systems.
Postdoc [1.21-2.22] Ultrafast fiber lasers Leibniz-IPHT, Jena, Germany	• Developed an all-fiber coupler with midIR fiber lasers. • Modelled optical gratings and different types of optical setups. • Created a specialized laser setup, now utilized for inscribing long period fiber gratings in fluoride fibers.
MSCA Fellow [4.17-1.21] European ITN FINESSE , Leibniz-IPHT, Jena, Germany	• Created a patented multicore fiber for extended sensor length. • Optimized the inscriptions system for failure free FBG inscription in multicore fibers. • Manufactured optical fiber shape sensors.
Research Engineer [10.13-2.17] Light-guided photonics lab ITMO University, Saint Petersburg, Russia	• Designed and built an optical setup from scratch to inscribe fiber gratings using a MOPA excimer laser system and Talbot interferometer. • Designed and constructed gas lines for the gas laser refill with various mixture options. • Contributed to the optimization and upgrade of the laser system to maintain its stable operation through continuous monitoring. • Developed techniques for fiber gratings inscription: slanted, long-period, superposition, superstructure, and chirped in telecommunication, active, and photosensitive fibers.

Optical simulations

- Zemax
- COMSOL (Wave optics)
- Lumerical FDTD,
- Lumerical MODE

Programming languages

- Matlab
 - Python
 - LabView
- ### CAD, Design
- AutoCAD, Inventor
 - Fusion 360
 - Affinity Designer
 - Affinity Publisher

Laser systems expertise

- Design, alignment, and testing of laser systems (high-power, CW and ultrafast).
- Experience in laser safety and system diagnostics.
- Experience with galvanometer scanners (Scanlab, Raylase) and motion platforms (Aerotech)

Other

- Quickly diagnosing issues in optical setups or during manufacturing processes.
- Experience working with mechanical, electrical, and software engineers on system integration.
- Leadership of cross-functional teams to deliver prototypes or meet production deadlines.
- Ability to write clear technical documents, specifications, and research papers.
- Skilled in presenting complex concepts to non-technical stakeholders.

EDUCATION

PhD in Physics Friedrich Schiller University, Jena, Germany	Dissertation " Optimization of multicore optical fibers with fiber Bragg gratings towards bend and shape sensing "
MSc. in Optical systems ITMO University, Saint Petersburg, Russia	Thesis "Laboratory setup for fiber Bragg gratings inscription based on KrF excimer laser system".
BSc. in Telecommunications ITMO University, Saint Petersburg, Russia	Thesis "Spectral characteristics of draw-tower step-chirped fiber Bragg gratings".

ADDITIONAL TRAINING

'Hands-On Training on Photonic Quantum Technologies', Jena, Germany	Workshop
Applied Biophysics FSU, Jena, Germany	Course
Scientific Writing, Jena, Germany	Workshop
'Field Application and Standardisation' Dept. of Engr., UCAM, Cambridge, UK	Workshop
'Fundamentals on Optical Sensors', B-PHOT, VUB, Brussels, Belgium	Workshop
'Entrepreneurship in Photonics', CommScope, Leuven, Belgium	Workshop
'Specialty Optical Fibers', Leibniz-IPHT, Jena, Germany	Workshop
'Distributed Sensing Methods' UAH, Madrid, Spain	Workshop

PATENTS

1. Idrisov, R., Rothardt, M., Becker, M. & Bartelt, H. Multikernfaser mit Multikern-Faserkomponenten sowie Verfahren zu ihrer Herstellung. (2021).

SELECTED PUBLICATIONS

1. Idrisov, R. et al. Composed Multi-core Fiber Structure for Extended Sensor Multiplexing with Fiber Bragg Gratings. *Sensors*, 22(10), 3837 (2022).
2. Idrisov, R., Baghdasaryan, T., Rothardt, M., Geernaert, T. & Bartelt, H. Experimental Approach for Complex Optical Fiber Angular Orientation and Twist Measurement. *Adv Photo Res* 2100161 (2021).
3. Idrisov, R., Floris, I., Rothardt, M. & Bartelt, H. Characterization and calibration of shape sensors based on multicore optical fibre. *Opt. Fiber Technol.* 61, 102319 (2021).
4. Idrisov, R. F. et al. Recording superpositions of fiber Bragg gratings using the Talbot interferometer. *Opticheski Zhurnal* 84, 56–60 (2017).
5. Idrisov, R. F. et al. Inscription of superimposed fiber Bragg gratings using a Talbot interferometer. *J. Opt. Technol.* 84, 694 (2017).
6. Idrisov, R. F. et al. Spectral characteristics of draw-tower step-chirped fiber Bragg gratings. *Optics & Laser Technology* 80, 112–115 (2016).