



Ravil Idrisov, Dr. rer. nat.

Optical Engineer · Berlin

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Profile

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 simulation, data processing, programming and hardware control. Brought multiple optical sensors from concept to mature prototype.

Work experience

Optical Engineer Airmo GmbH, Berlin	– 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	Mar 2025 – now
R&D Engineer Fusion Bionic GmbH, Dresden	– Designed an upscaling technology, now being developed through two concepts I proposed – Feasibility studies of the technology for specific materials and functions – High-power ps and ns lasers; programmed control of high-precision stages, signal generators and measurement systems	Mar 2022 – Apr 2025
Postdoc Ultrafast Fiber Lasers, Leibniz-IPHT, Jena	– Developed an all-fiber coupler for mid-IR fiber lasers – Modelled optical gratings and optical setups – Built a laser setup now used to inscribe long-period gratings in fluoride fibers	Jan 2021 – Feb 2022
MSCA Fellow European ITN FINESSE, Leibniz-IPHT, Jena	– Created a patented multicore fiber for extended sensor length – Optimized the inscription system for failure-free FBG inscription in multicore fibers – Manufactured optical fiber shape sensors	Apr 2017 – Jan 2021
Research Engineer Light-Guided Photonics Lab, ITMO University, Saint Petersburg	– Built a fiber grating inscription setup from scratch with a MOPA excimer laser and Talbot interferometer – Designed and built gas lines for laser refills with various mixtures – Optimized and upgraded the laser system for stable operation – Developed slanted, long-period, superimposed, superstructure and chirped grating inscription in telecom, active and photosensitive fibers	Oct 2013 – Feb 2017

Education

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

Skills

Optical simulation

Laser systems

	Zemax COMSOL Wave Optics	Design, alignment and testing of high-power, CW and ultrafast lasers
	Lumerical FDTD Lumerical MODE	Laser safety and system diagnostics
	Programming	Galvanometer scanners (Scanlab, Raylase), motion platforms (Aerotech)
	Python MATLAB LabVIEW	Other
	CAD, design	Fast diagnosis of issues in optical setups and manufacturing
	AutoCAD Inventor Fusion 360	System integration with mechanical, electrical and software engineers
	Affinity Designer Affinity Publisher	Leading cross-functional teams to deliver prototypes on deadline
		Clear technical documents, specifications and papers
		Presenting complex concepts to non-technical stakeholders
Patent	01 Idrisov, R., Rothhardt, M., Becker, M. & Bartelt, H. Multikernfaser mit Multikern-Faserkomponenten sowie Verfahren zu ihrer Herstellung (2021).	
Selected publications	01 Queißer, M., Volter, K., Bilal, M., Mishin, I., Fries, L., Vilaseca, D., Darynova, Z., Juéry, C., Armandillo, E., Idrisov, R. & Stepanova, D. Airborne imaging spectrometer measurements of methane releases under turbulent conditions. <i>Int. J. Remote Sens.</i> (2026). 02 Li, C., Apelt, S., Feuer, A., Idrisov, R. & Bergmann, U. Bio-inspired surface modification of aluminium heat exchanger fins using laser structuring and PDMS coating for improved and scalable hydrophobic and ice-adhesion performance. <i>J. Adhes.</i> 101(16), 1906–1921 (2025). 03 Idrisov, R. et al. Composed multicore fiber structure for extended sensor multiplexing with fiber Bragg gratings. <i>Sensors</i> 22(10), 3837 (2022). 04 Idrisov, R., Baghdasaryan, T., Rothhardt, M., Geernaert, T. & Bartelt, H. Experimental approach for complex optical fiber angular orientation and twist measurement. <i>Adv. Photonics Res.</i> 2100161 (2021). 05 Idrisov, R., Floris, I., Rothhardt, M. & Bartelt, H. Characterization and calibration of shape sensors based on multicore optical fibre. <i>Opt. Fiber Technol.</i> 61, 102319 (2021). 06 Idrisov, R. F. et al. Recording superpositions of fiber Bragg gratings using the Talbot interferometer. <i>Opticheskii Zhurnal</i> 84, 56–60 (2017). 07 Idrisov, R. F. et al. Inscription of superimposed fiber Bragg gratings using a Talbot interferometer. <i>J. Opt. Technol.</i> 84, 694 (2017). 08 Idrisov, R. F. et al. Spectral characteristics of draw-tower step-chirped fiber Bragg gratings. <i>Optics & Laser Technology</i> 80, 112–115 (2016). 09 Gribaev, A. I., Pavlishin, I. V., Stam, A. M., Idrisov, R. F., Varzhel, S. V. & Konnov, K. A. Laboratory setup for fiber Bragg gratings inscription based on Talbot interferometer. <i>Opt. Quantum Electron.</i> 48, 540 (2016).	
Additional training	Hands-On Training on Photonic Quantum Technologies — Jena, Germany Applied Biophysics (course) — FSU Jena, Germany Scientific Writing — Jena, Germany Field Application and Standardisation — Dept. of Engineering, University of Cambridge, UK	Fundamentals of Optical Sensors — B-PHOT, VUB, Brussels, Belgium Entrepreneurship in Photonics — CommScope, Leuven, Belgium Specialty Optical Fibers — Leibniz-IPHT, Jena, Germany Distributed Sensing Methods — UAH, Madrid, Spain