Arthur Minakhmetov

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Summary

A **Ph.D.** in Optical Communications and Signal Processing with **8+ years of experience** at leading companies (Google, Nokia/ASN). I specialize in designing, simulating and evaluating **physical layer algorithms** for high-capacity optical systems using **Machine Learning** (for QoT estimation, amplifier modeling). Proficient in **Python** (PyTorch), **C++**, and **MATLAB**, with a strong publication record and experience generating **intellectual property**.

Professional and Research Experience

- **Google UK Ltd** — London, UK
  Optical Network Engineer (Automation) — *03.2025 – currently*
  - Automation of systems and tools for Google's global network.
  - Design and analysis of large-scale Metro and Long Haul DWDM systems.
- **Alcatel Submarine Networks, Nokia Corporation** — Nozay, France
  WDM Optical Network Research Engineer, Terrestrial System Design — *06.2020 – 03.2025*
  - R&D on Modeling of signal impairments due to ROADM/FOADM filtering effect.
  - R&D on Quality of Transmission (QoT) estimation using ML tools.
  - R&D on Modeling of Optical Amplifiers (EDFA) using ML tools.
  - Advanced studies on Optical Network modeling and design.
- **Information Processing and Communication Laboratory, Télécom-Paris** — Palaiseau, France
  PhD candidate with doctoral contract — *10.2016 – 12.2019*
  - Investigation of Data Centers Networks (DCN) running on Optical Packet Switching (OPS).
  - Development of new Transmission Control Protocols (TCP) adapted for use in DCN on OPS.
  - Development of C++ DCN simulator, running custom TCP on OPS.
  - Teaching assistance, providing labworks for students on optics, photonics and network management.
- **Columbia University** — New York, USA
  Visiting scholar — *03.2019 – 06.2019*
  - Investigation and research on Software Defined Optical Networks for 5G applications.
- **Nokia Bell Labs** — Nozay, France
  Research Intern — *03.2016 – 08.2016*
  - Study of Cross-Polarization Modulation (XPolM) impairments in optical links using Information Theory. Proposed solutions through joint use of space-time codes and Forward Error Correcting (FEC) Codes.
- **LiquidInSpect Solutions** — Paris, France
  Technical and Management role — *03.2018 – 03.2019*
  - Organized wine spectra analysis through Machine Learning methods. LiquidInSpect – a spin-off from IRwine.
- **IRwine** — Paris, France
  Chief Technology Officer role — *02.2016 – 02.2018*
  - Co-founder of a startup on wine quality control by the means of optical spectroscopy. Organized a research lab, supervised experiments and results analysis, developed a prototype. IRwine is French Tech Ticket winner.
- **T-Waves Technologies** — Montpellier, France
  Engineering intern — *05.2015 – 08.2015*
  - Design of optical systems for imaging in the THz domain. Invented patent-protected new type of optical systems for line-scanning, machine-vision systems working in THz domain.

Technical Skills

- **Programming Languages:** C++, Python, MATLAB, C
- **Scientific calculation:** Numpy, Pandas, Scikit-learn, PyTorch, MathCAD
- **Development Environment:** Microsoft Visual Studio, Spyder, Jupyter, Notepad++

Education

- **Télécom Paris, Institut Polytechnique de Paris** — Palaiseau, France
  Ph.D. Networks, Information and Communications — *2016 – 2019*
  - Thesis : Cross-layer Hybrid and Optical Packet Switching
- **Université Paris-Saclay** — Palaiseau, France
  M.Sc. "Optical Networks & Photonic Systems" — *2016*
  - Thesis : Study of the coding for the compensation of nonlinear effects
- **Institut d'Optique Graduate School (École supérieure d'optique)** — Palaiseau, France
  Engineering degree in Applied and Theoretical Optics, equivalent to M.Sc. — *2014 – 2016*

Licenses & Certifications

- **Machine Learning Zoomcamp 2023:** 6 month Boot-camp on ML and DS: Cert. No 9D4D4A, Feb 2023
- **Stanford University Machine Learning:** ML course offered via Coursera: Cert. No NJCN97Z6J6LZ, Jul 2020

Languages

- **English:** fluent, TOEIC 980/990; **French:** fluent; **Russian:** fluent

Publications

Conference Proceedings

- **A. Minakhmetov,** B. Prieur, M. Le Monnier, D. Rouvillain, B. Lavigne, "Recalibration Learning: Enabling Universal Transfer of ML Model of Gain and NF for Remote Optically Pumped Amplifiers," in *Proc. of the IEEE/OSA Optical Fiber Communication Conference (OFC)*, no. M3I.2, San Diego, USA: Mar. 2024.
- **A. Minakhmetov,** B. Prieur, M. Le Monnier, D. Rouvillain, B. Lavigne, "Digital Twin of Unrepeatered Line Based on Raman and Remote Optically Pumped Amplifier Machine Learning Models," in *Proc. of the IEEE/OSA Optical Fiber Communication Conference (OFC)*, no. W4H.4, San Diego, USA: Mar. 2023.
- **A. Minakhmetov,** T. Zami, B. Lavigne and A. Ghazisaeidi, "ANN-Based Evaluation of FOADM Impact on 400ZR+ Channels in WDM Ring Networks," in *Proceedings of 2022 22th OptoElectronics and Communications Conference (OECC)*, no. MF2-3, Toyama, Japan: Jul. 2022.
- **A. Minakhmetov,** T. Zami, B. Lavigne and A. Ghazisaeidi, "Accurate Prediction via Artificial Neural Network of OSNR Penalty Induced by Non-uniform WSS Filtering," in *Proceedings of 2021 26th OptoElectronics and Communications Conference (OECC)*, no. M4A.1., Hong Kong, China (virtual): Jul. 2021.
- **A. Minakhmetov,** C. Gutterman, T. Chen, J. Yu, C. Ware, L. Iannone, D. Kilper, and G. Zussman, "Experiments on Cloud-RAN wireless handover using optical switching in a dense urban testbed," in *Proc. of the IEEE/OSA Optical Fiber Communication Conference (OFC)*, no. Th2A.25, San Diego, USA: Mar. 2020.
- J. Yu, C. Gutterman, **A. Minakhmetov**, M. Sherman, T. Chen, S. Zhu, G. Zussman, I. Seskar, and D. Kilper, "Dual use SDN controller for management and experimentation in a field deployed testbed," in *Proc. of the IEEE/OSA Optical Fiber Communication Conference (OFC)*, no. T3J.3, San Diego, USA: Mar. 2020.
- **A. Minakhmetov,** C. Ware and L. Iannone. "Data Center's Energy Savings for Data Transport via TCP on Hybrid Optoelectronic Switches,," in *Proc. of the IEEE Photonics Conference (IPC)*, no. TuC3.3, San Antonio, USA, Oct. 2019.
- **A. Minakhmetov,** C. Ware and L. Iannone. "Hybrid and Optical Packet Switching Supporting Different Service Classes in Data Center Network," in *Proc. of the IFIP 23rd Conference on Optical Network Design and Modelling (ONDM)*, Athens, Greece, May. 2019.
- **A. Minakhmetov,** A. Nagarajan, L. Iannone and C. Ware. "On the Latencies in a Hybrid Optical Packet Switching Network in Data Center," in *Proc. of the IEEE/OSA Optical Fiber Communication Conference (OFC)*, no. W2A.21, San Diego, USA, Mar. 2019.
- **A. Minakhmetov,** H. Chouman, L. Iannone, M.Lourdiane and C. Ware, "Network-level strategies for best use of optical functionalities," in *Proc. of the IEEE Int. Conf. on Transparent Optical Networks (ICTON)*, no. Tu.B1.3, Bucharest, Romania: IEEE, Jul. 2018.
- **A. Minakhmetov,** C. Ware, and L. Iannone. "Amélioration du débit des réseaux optiques via TCP Stop-and-Wait sur les commutateurs hybrides," in *Proc. of the ALGOTEL 2018*, May 2018, Roscoff, France.
- **A. Minakhmetov,** C. Ware, and L. Iannone, "Optical Networks Throughput Enhancement via TCP Stop-and-Wait on Hybrid Switches," in *Proc. of the IEEE/OSA Optical Fiber Communication Conference (OFC)*, no. W4I.4, San Diego, USA: Mar. 2018.

Journals

- T. Chen, J. Yu, **A. Minakhmetov**, C. Gutterman, M. Sherman, S. Zhu, S. Santaniello, A. Biswas, I. Seskar, G. Zussman, D. Kilper, "A Software-Defined Programmable Testbed for Beyond 5G Optical-Wireless Experimentation at City-Scale," in *IEEE Network*, Volume: 36, No. 2, pp. 90-99, March/April 2022.
- **A. Minakhmetov,** C. Ware and L. Iannone,"Hybrid and optical packet switching supporting different service classes in data center network," in *Springer's Photonic Network Communications*, Special Issue, 10 July, 2020.
- **A. Minakhmetov,** C. Ware and L. Iannone. "Data Center's Energy Savings for Data Transport via TCP on Hybrid Optoelectronic Switches," in *IEEE Photonics Technology Letters*, Volume: 31 , Issue: 8 , Apr. 2019.
- **A. Minakhmetov,** C. Ware, and L. Iannone, "TCP Congestion Control in Datacenter Optical Packet Networks on Hybrid Switches," *IEEE/OSA J. Opt. Commun. Netw. (JOCN)*, vol. 10, no. 7, pp. B71–B81, Jul. 2018.

Patents

- C. Archier, B. Moulin and **A. Minakhmetov** "Imaging Device with Multipixel Sensor for Constituting an Image with Terahertz Radiation," French Patent Bureau, FR3069372, 2019-01-25