

# Arthur (Artur) Minakhmetov

Ph.D. in Networks, Information and Communications, Télécom Paris

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## PROFESSIONAL INTERESTS

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My professional interest are focused on networks management and applied Machine Learning to achieve their best performance. In particular, my area expertise lies in Wavelength Division Multiplexing (WDM) optical networks, Fast Optical Switching networks in Data Centers and Cloud-Radio Access Networks (C-RAN).

## PROFESSIONAL AND RESEARCH EXPERIENCE

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- **Alcatel Submarine Networks, Nokia Corporation** Nozay, France  
*WDM terrestrial optical network engineer* 06.2020 – currently
  - R&D activities on WDM optical networks, exploring new solutions through application of Machine Learning.
- **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 Hybrid Optical Packet Switching (HOPS) technology, where optical packet transmission is regulated by custom Transport Control Protocols (TCP).
  - Development of new TCP adapted for use in DCN on HOPS
  - Development of C++ DCN simulator, running custom TCP on HOPS.
  - 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 SDN controlled 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  
*CTO role* 02.2016 – 02.2018
  - Co-founder of a startup on wine quality control by the means of optical spectroscopy in Visible and Near Infrared (VIS/NIR) wavelength domain. Organized a research lab, supervised experiments and results analysis, developed a prototype. [IRwine](#) is French Tech Ticket winner with €50,000 finding.
- **Independent R&D consultant-engineer** Palaiseau, France  
*R&D engineer* 11.2015 – 03.2016
  - Design of optical systems for imaging in the THz domain. Developed patent-protected scanning solution.
- **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.

## EDUCATION

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- **Télécom Paris, Institut Polytechnique de Paris** Palaiseau, France  
*Ph.D. Networks, Information and Communications* 2016 – 2019
  - Thesis : Cross-layer Hybrid and Optical Packet Switching
  - Advisor and Co-advisor : Associate Prof. Cédric Ware and Associate Prof. Luigi Iannone
- **Université Paris-Saclay** Palaiseau, France  
*M.Sc. “Networks Optics & Photonic Systems”* 2016
  - Thesis : Study of the coding for the compensation of nonlinear effects
  - Advisor : Research Engineer Patricia Layec
- **Institut d’Optique Graduate School (École supérieure d’optique)** Palaiseau, France  
*Engineering degree in Applied and Theoretical Optics, equivalent to M.Sc.* 2014 – 2016
- **Bauman Moscow State Technical University** Moscow, Russia  
*Diplomas of Bachelor’s and Master’s degrees in laser techniques and technology* 2008 – 2014

## TECHNICAL SKILLS

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- **Programming Languages:** C++, Python, Delphi
- **Scientific calculation:** PyTorch, MATLAB, MathCAD
- **Optical systems design:** ZEMAX, OSLO

## LANGUAGES

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

## HOBBIES

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- Music, Classical music, cinema, TV series, sports – skiing, surfing, swimming.

## PUBLICATIONS

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### Conference Proceedings

- **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, [invited paper](#).
- **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, [invited paper](#).
- **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