

# ILYA KOROGODIN

GNSS Engineer, Professor, PhD at NavSysLab

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## EXPERIENCE

### Head Researcher

**Navigation Systems Laboratory**   Moscow   2013 - Ongoing

at National Research University MPEI

- Lead a dozen of GNSS professionals (including 4 PhD) in our R&D routine
- Evolve GNSS receiver/transmitter library: firmware, RTL modules, utilities
- Develop devices/chips or apply our libraries to a client hardware
- Conduct researches for industry and government (20+ contracts)

### Associate Professor

**Radio Systems Department**   2013 - Ongoing

at National Research University MPEI

- Find young talents and grow them up to professionals (20+ graduated)
- Teach professional course GNSS Receivers, write articles and books

### Engineer, Researcher, Teaching Assistant

**Modern Navigation and Telecommunication Center**   2006 - 2013

at Moscow Power Engineering Institute

- GNSS R&D, teaching

## NOTABLE PROJECTS

### Naviware

2013 - Ongoing

GNSS signal processing and generation framework for Xilinx Zynq

- I maintain the project, define the architecture and interfaces, decompose to issues for other teammates
- developed and coded baseband signal processing algorithms for acquisition, tracking, synchronization, decoding and resilient positioning
- developed and coded baseband signal generation modules for modern and legacy GPS/GLONASS/Galileo/Beidou/SBAS signals
- developed and coded RTL modules for signal generation
- I made a bit-accurate board simulation; it allows to develop a firmware without any hardware in a confident and controlled environment, get test results faster
- developed an automated test system, including hardware autotests
- created data exchange protocols, data visualisation tools and so on

### Clonicus, Adicus, Nomadicus and other Zynq-based boards

2017 - 2021

The OEM boards controlled by Naviware: all-band, all-system GNSS receiver, GNSS transmitter, CRPA and altitude determination receiver

- I defined requirements for the boards and their structure, decomposed the projects to issues and controlled the issues progress
- modified Naviware for the boards
- adapted engineering documentation for clients

### CRPA processing chip and satellite receiver chip

2016 - 2018

- defined the chips architecture, requirements to modules and interfaces
- developed and coded RTL and firmware for the chips (based on Naviware)
- I adjusted RTL based on a feedback from a topology team

### LocSys

2019 - 2021

- I led a Locata-like local navigation system prototype development (system specs and protocols, beacons, receiver, firmware, tests)

### GLONASS CDMA signals

2008 - 2009

- I calculated receiver specs for possible signal structures and modulation schemes: acquisition time and power consumption, multipath mitigation, pseudorange accuracy and so on

## SUMMARY

Completed projects make me not T-, but a W-person. I've developed receivers and chips, created pseudolites, simulators, multi-antenna/board/device systems, chosen new GLO signals and built the Team

## EDUCATION

### PhD in Navigation and Location

National Research University MPEI

2010 - 2013

### MSc and BSc in EE with honors

Moscow Power Engineering Institute

2004 - 2010

GPA

5.0 / 5

Extra:

Educational management program

2017

## TOOLS

- git, gitlab, wiki, messengers for projects
- C/C++, gcc/gdb, valgrind for firmware
- Matlab, MathType for algorithms development
- Python, gitlab, docker for integration testing
- RTKLIB, u-blox for interability tests and RTK
- lab eq: R&S SMBV, FSV, ZVA, Spirent simulator
- SystemVerilog, Vivado, msim for HDL design
- LaTeX, matlab, inkscape for reports and books
- Inkscape, beamer and passion for presentations
- English (B2), Russian (native) for communication

## PUBLICATIONS AND IP

- **GLONASS Handbook** co-author (in russian)
- **GNSS Receivers** e-book author (in russian)
- GNSS Receivers professional course materials
- Radio systems simulation course materials
- **ION GNSS** conference publications (2012, 2017)
- 30-40 scientific articles and conference papers
- 4 Russian patents, 6 registered software products

## MEMBERSHIP

- ION, IEEE, RIN (Former)

## AWARDS

### Young Scientist Award

The USA Electromagnetics Academy for Beamforming algorithms research

Rome, Italy

2019

### Young Scientist Award

The USA Electromagnetics Academy for OFDM navigation signals research

Toyama, Jp

2018

### Scientific Achievement Badge

National Research University MPEI

Moscow

2020

### Tsiolkovsky Medal

Federation of Cosmonautics of Russia

Moscow

2018