



MINERVA

A SAFRAN ELECTRONICS & DEFENSE ACADEMIC PROGRAM

We believe the future of PNT technology is built on collaboration. That's why we partner with academic institutions to drive research forward and develop the next generation of navigation solutions.

OPENING NEW DOORS FOR RESEARCH

Traditionally, it has been challenging for research and learning institutions to own and use test and simulation tools for Positioning, Navigation and Timing (PNT) due to the extremely high cost of proprietary-based systems. Safran is changing the game by offering the powerful Skydel Simulation Engine to the research community through Minerva – a dedicated partnership program for qualified institutions. This offer includes a permanent Skydel Simulation Engine license with all frequencies and constellations as well as student licenses.

Skydel Simulation uses an innovative and modern approach that leverages software, advanced graphics cards (GPUs) and Software Defined Radios (SDRs). As a Minerva member, Skydel gives you the ability simulate GNSS RF signals in real-time, build your own custom signals and connect to other systems and devices (i.e. Sensors, IMUs...) through our open source plug-in capabilities. Lastly, Skydel includes the ability to generate and test the vulnerability of GNSS/GPS equipment and systems using integrated interference, jamming and spoofing capabilities. Because Skydel leverages COTS hardware (GPU, NIC, SDR), it stands alone as the only GNSS Simulation Solution that can run independently of dedicated hardware.

Make Skydel part of your curriculum today.

SKYDEL GNSS SIMULATION SOFTWARE

Why is Skydel Different?

Skydel is a GNSS/GPS simulation software engine packed with a rich feature set — multi-constellation/ multi-frequency signal generation, remote control from user-defined scripts, and integrated interference generation

Our software. Your hardware

- Maximum scalability and flexibility
- Agile/rapid software development process means more updates, more frequently
- Can generate thousands of signals
- Optimal value and future-proof
- Open architecture does not confine you to proprietary hardware
- Easy to upgrade, maintain and support
- Wide range of plug-ins and scripts available

Features



REAL-TIME GNSS
SIMULATOR



SCALABLE
PLATFORM



POWERFUL &
SIMPLE
AUTOMATION



USER-DEFINED
WAVEFORMS



ADVANCED
INTERFERENCE
SIMULATION



MULTI-
CONSTELLATION /
MULTI-FREQUENCY



THE SAFRAN OFFER



Technical Specifications

Multi-constellation / Multi-frequency

- GPS, GLONASS, GALILEO, BEIDOU, SBAS, QZSS, NavIC, RTK, Custom.
- Support for restricted signals (GPS & Galileo).
- All-In-View simulation.

User-defined waveforms

- Chirp, CW, BOC, AWGN, BPSK & Pulse modulation + custom IQ file.
- Combine dozens of signals.
- Real-time results on spectrum interface.

Real-time GNSS simulator

- Simulation entirely GPU-generated
- 1000Hz simulation iteration rate
- Most parameters can be modified at runtime.
- Multi-vehicle & multi-antenna simulation
- Advanced multipath models

Powerful & simple automation

- Comprehensive API (Python, C#, C++).
- Innovative automatic Python scripting.

Your Package

Donation of Skydel Simulation Engine

Skydel License

- Renewed annually & install on any machine (Windows & Linux)
- Advanced features available upon request

Flexibility of Skydel

- Build your own simulator with COTS hardware: SDR, CPU, GPU
- Use as a standalone software-only solution to build scenarios

How do you qualify?

- ☒ GNSS in current curriculum or planned curriculum
- ☒ Solution used for only research & education
- ☒ Willingness to allow Safran to use logo on web site

APPLY NOW!

Learn more about the Minerva Academic Program here <https://safran-navigation-timing.com/minerva/>

Learn more about building your own simulator here <https://safran-navigation-timing.com/building-your-own-gnss-simulator/>



UNIVERSITY OF
ALABAMA



ARIEL
UNIVERSITY



UNIVERSITY
OF TECHNOLOGY

NAV

AACHEN
UNIVERSITY



TU Delft



ÉTS
ÉCOLE DE
TECHNOLOGIE
SUPÉRIEURE



UNIVERSITY
OF FINLAND



70
FUNDATION
FUNDATION



KENT STATE
UNIVERSITY



AT & T
UNIVERSITY

Carleton
University

ETH zürich

Fraunhofer

GT
Georgia
Tech



UNIVERSITY
OF GUELPH

Loughborough
University

LSU



NC STATE
UNIVERSITY

THE OHIO STATE
UNIVERSITY

Oregon State
University



Queen's
University

POWERED
BY TRUST

Stanford
University

UNB
Universidad Autónoma
de Barcelona

uc3m
Universidad Carlos III
de Madrid

UCI

UNB
UNIVERSITY OF NEW BRUNSWICK

universidad
león

UNIVERSIDAD
NACIONAL
DE LA PLATA

Université
de Lille

UNIVERSITY OF
CALGARY

University of Colorado
Boulder

University of Dayton
Research
Institute

UNIVERSITY OF
SOUTH FLORIDA

The University of
Nottingham

University of
Stuttgart

UNSW
SYDNEY

Universidad
Rey Juan Carlos

THE UNIVERSITY OF
MELBOURNE

YORK
UNIVERSITY



LSBU

MACQUARIE
University



UNIVERSITY
OF TECHNOLOGY

WU
WIRTSCHAFTS
UNIVERSITÄT
WIEN VIENNA
UNIVERSITY OF
ECONOMICS
AND BUSINESS



Northeastern
University



SAFRAN

MINERVA
A SAFRAN ELECTRONICS & DEFENSE ACADEMIC PROGRAM

unesp

United Arab Emirates University