KHANH-NINH NGUYEN

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PROFILE

A Research Engineer with a solid background in applied statistics and machine learning in climate.

KEY SKILLS

Statistics & Machine learning Profound experience in applying statistical inference (hypothesis testing, regression) and machine learning techniques in climatology.
Data analytic Expertise in climate data analysis, especially in time series analysis.

WORK EXPERIENCE

Research Engineer 02/2024 – now
CNRS, IPGP (Institut de Physique du Globe de Paris)

- Analyze the spatial distribution of water vapor trends (daily, monthly and annual) from 1995 to 2023 using various big data sources: satellite, ground-based observations, and climate models.
- Homogenize a water vapor dataset retrieved from GPS measurements for Data TERRA (an open platform for Earth system observations), including the three main tasks of quality checking (anomaly detection), segmenting (change-point detection), and correcting time series.
- Develop an R package to detect artificial offsets and attribute them to climatic time series. View the ongoing work on GitHub at https://github.com/khanhninhnguyen/attr

PhD candidate 10/2020 – 12/2023
IPGP, IGN (Institut national de l'information géographique et forestière) *Paris*

- Develop a statistical method to determine the origin of the change-point in the segmentation. The method combines hypothesis testing (t-test) and classification. Four classification methods, namely decision tree (CART), Random Forest, Linear Discriminant Analysis, and k-NN, have been considered and evaluated using cross-validation.
- Characterized and modeled water vapor signals from GPS measurements, especially focusing on heteroskedasticity and autocorrelation, and compared them with climate models. The noise model is selected in the time domain using ARIMA models based on statistical criteria (i.e., Bayesian information criterion, Akaike information criterion).
- Estimated water vapor trends using Generalized Least Squares in the presence of change-points. The goal is to overcome the collinearity issue.

Research Intern 03/2020 – 09/2020
IPGP, IGN *Paris*

- Reviewed the state of the art in statistical segmentation.
- Investigated the sensitivity of a statistical segmentation method to various data properties in detecting artificial change-points.

Research Intern 03/2019 – 09/2019
Paris Observatory *Paris*

- Visualized and analyzed both temporally and spatially the radar backscatter data from the Global Precipitation Measurement (GPM) mission (by NASA and JAXA).

EDUCATION

Ph.D. in Applied Mathematics and Environmental Science, 2020 – 2023
University Paris Cité

Master 2 in Fundamentals of remote sensing - Méthodes physiques en télédétection, 2019 – 2020
University Paris Cité

Master 2 in Water, Air, Pollution and Energy (WAPE), 2018 – 2019
Institute Polytechnique de Paris

Master 1 in Advanced Materials Science and Nanotechnology, 2017 – 2018
University of Science and Technology of Hanoi

Bachelor in Physics, (Talent program) 2013 – 2017
Hanoi National University of Education

LANGUAGE

Languages	English (proficient), French (intermediate)
Programming	Python, R, SQL, Git

PUBLICATION

Journals

Nguyen KN, Quarello A, Bock O, Lebarbier E. Sensitivity of Change-Point Detection and Trend Estimates to GNSS IWV Time Series Properties. *Atmosphere*. 2021. https://www.mdpi.com/2073-4433/12/9/1102

Nguyen KN, Bock O, Lebarbier E. A statistical method for the attribution of change-points in segmentation of IWV difference time series. *Internaltional Journal of Climatology*. 2024. https://rmets.onlinelibrary.wiley.com/doi/full/10.1002/joc.8441

INDEPENDENT STUDY

The Analytics Edge 2022 2020
by MITx, edX – Certificate.

Machine Learning with Python-From Linear Models to Deep Learning 2019
by MITx, edX – Certificate.

Fundamentals of Statistics 2019
by MITx, edX – Certificate.

Probability - The Science of Uncertainty and Data 2019
by MITx, edX – Certificate.

SCHOLARSHIPS/AWARDS

PhD Fellowship, 07/2020
The Earth and Environment Science and Physics of the Universe in Paris Doctoral School

First Prize in the "University of Science and Technology of Hanoi 20" competition for innovative and creative research ideas, 03/2018
University of Science and Technology of Hanoi

Scholarship for outstanding student, 09/2017
University of Science and Technology of Hanoi