

# Hadi

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## PROFILE

Remote sensing (data) scientist with 6+ years' international experience, passionate to contribute to environmental conservation and sustainable resource management. Possess in-depth theoretical and practical knowledge of methodology and tools for land resources mapping and monitoring using optical satellite data. Interested in continuing to develop robust, transferable, well-validated, and policy-relevant remote sensing-based land resources mapping and monitoring methods, systems, and information products, leveraging on state-of-the-art multi-source (sensor) data integration, (physics-informed) machine learning, high performance (cloud) computing, and citizen science engagement (crowdsourcing).

## EXPERIENCE

**Research scholar / remote sensing specialist**, International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria: February 2019—

- Lead to the ongoing development of proof of concept for an automated land cover (LC) map generation based on open source datasets and technologies in Indonesia for RESTORE+ project.
- Closely collaborate with RESTORE+ project research partners at the World Agroforestry Center (ICRAF) Indonesia Country Programme to build automated Google Earth Engine based algorithms based on ICRAF's previous works to generate earlier LC maps.
- Develop expert tools and conduct capacity development workshops in mapping.
- Contribute to the design, preparation, execution, and socialization of the crowdsourcing campaigns of the RESTORE+ project, as well as analysing the collected data in relation to the automated LC map generation process.
- Link analyses on optical based remote sensing products with radar based remote sensing products to generate detailed degradation maps for RESTORE+ project.
- Contribute to publications on remote sensing related topics of the RESTORE+ project.

**Doctor of Science (Technology) in Geoinformatics**, Aalto University, Espoo, Finland: 2015 – 2018.

- Dissertation project titled "*Satellite optical remote sensing of forest canopy cover in boreal and tropical biomes*" supervised by Prof. Miina Rautiainen. Graded Pass with Distinction.
- Within three years published five (first author in four) international peer-reviewed research articles, two in the discipline's leading journal (see publications below).
- In the process, quickly surveyed and familiarized with newly encountered domain-specific literature, ground and satellite data or products, and analysis methods and tools.
- Conceptualized and designed modeling experiments, independently performed complex analysis employing diverse analytical approaches, including optical satellite image pre-processing and feature extraction, machine (statistical) learning, physics-based optical signal simulations, and global sensitivity analysis.
- Programmed an algorithm for continuous change detection using long record of satellite time series. In addition, designed and implemented custom interactive application to assist visual interpretation of satellite data required in one publication.
- Initiated, coordinated, and timely executed two international research collaborations, both resulting in international peer-reviewed publications (see publications below).



- Contributed satellite remote sensing expertise to and supported a co-authored work (see publications below).
- Developed, instructed, and assessed two hands-on learning assignments for two graduate-level courses: (1) “*Mapping forest canopy cover using Sentinel-2 satellite image and Sentinel Application Platform (SNAP) software*” practical for “Photogrammetric, Laser Scanning and Remote Sensing” course; and (2) “*Online resources for Earth Observation: data portals, applications, and tools (including Google Earth Engine)*” for “Advanced Remote Sensing” course. Both practicals rated highly by students.

**Participant in Young Scientists Summer Program**, International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria: 2017 – 2017.

- Conducted and documented the proposed research project titled “*Three decades of forest cover changes in the humid tropical Indonesia: detection and verification at high resolution*” supervised by Dr. Andrey Krasovskii and Mr. Ping Yowargana from the Ecosystems Services and Management (ESM) program.

**Master of Science in Geoinformation and Earth Observation for Environmental Modeling and Management**, Lund University, Lund, Sweden, and University of Twente, Enschede, The Netherlands: 2013 – 2015.

- Thesis is titled “*Multivariate statistical analysis for estimating grassland leaf area index and chlorophyll content using hyperspectral measurements: case study in Majella National Park, Italy*” supervised by Prof. Roshanak Darvishzadeh. Graded 90 out of 100.

**Research Assistant**, University of Malaya, Kuala Lumpur, Malaysia: 2012 – 2013.

- Contributed to two consultancy projects “*Geographical Information System (GIS) application to measure the value of green lungs in urban housing market*” and “*Housing affordability index*”. Responsibilities include conducting literature review (for methodology design), primary and secondary data collection, GIS database development, project documentations and presentations to stakeholders.

**Bachelor of Arts (Honours) with Geography major and Economics minor**: University of Malaya, Kuala Lumpur, Malaysia: 2009 – 2012.

- Thesis is titled “*Flood risk assessment and mapping using Geographical Information System: case study in Kuala Lumpur, Malaysia*”. Graded A.

## HONOURS & AWARDS

- Selected for a fully-funded doctoral research work at Aalto University, Finland, 2015 – 2018.
- Won Best Doctoral Dissertation at Aalto University School of Engineering (€3,000), 2018.
- Won Publication Award of Aalto University School of Engineering (€1,000), 2017.
- Selected as one of the two representatives from Finland in the IIASA Young Scientists Summer Program, Austria, with financial support from the Academy of Finland (€3,950), 2017.
- Awarded Erasmus Mundus Master Course full scholarship (joint program in Sweden and The Netherlands) by the European Commission, 2013 – 2015.
- Won best student in geography department prize, University of Malaya, Malaysia, 2012.
- Awarded full scholarship for undergraduate study abroad (Malaysia) by the Indonesian government, 2009 – 2012.

## SKILLS & SOFTWARE PROGRAMS

- Languages: English (fluent), Indonesian (native speaker).
- Computer skills: R, Google Earth Engine Javascript API, ESRI® ArcGIS, QGIS, Sentinel Application Platform (SNAP), Python, Exellis® ENVI, ERDAS® Imagine, MS® Office (Word, Excel, PowerPoint, etc.).



## ADDITIONAL TRAINING

- Finnish IT Center For Science (CSC) course “Python in High-Performance Computing”, 2019.
- CSC course “Analysing large datasets with Apache Spark”, 2018.
- CSC course “Introduction to Python GIS”, 2018.
- CSC course “Linux 1”, 2017.
- Nordic e-Infrastructure Collaboration “CodeRefinery” Workshop, 2017.
- European Space Agency (ESA) “Advanced Training Course on Land Remote Sensing”, 2017.
- European Association of Remote Sensing Laboratories (EARSeL) Summer School “Advanced Geomatics in Modern Forestry” track “RADAR and LiDAR in Forestry”, 2016.
- University of Twente special modules “Hyperspectral Remote Sensing”, 2015.

## CONFERENCES (selection)

- Eighth meeting of The Association for Forest Spatial Analysis Technologies (ForestSAT), College Park, Maryland, USA, 2018.
- Google Earth Engine User Summit, Google Campus, Dublin, Ireland, 2018.
- Remote Sensing of Fluorescence, Photosynthesis And Vegetation Status, ESA Center for Earth Observation (ESRIN), Frascati, Italy, 2017.
- Third workshop of the EARSeL Forestry Special Interest Group, Krakow, Poland, 2016.
- Presenting regularly at the Finnish Remote Sensing Days and annual Finnish-Estonian Remote Sensing Workshop, 2015 – 2018.

## ACADEMIC SERVICE

- Reviewer for Remote Sensing of Environment (#1 in the field), 1 manuscript.
- Reviewer for ISPRS Journal of Photogrammetry and Remote Sensing (#2 in the field), 1 manuscript.

## PUBLICATIONS

International Peer-Reviewed Publications:

- Hadi, A. Krasovskii, V. Maus, P. Yowargana, S. Pietsch, M. Rautiainen. *Monitoring deforestation in rainforests using satellite data: a pilot study from Kalimantan, Indonesia*. Forests, 9(7), 389, 2018.
- Hadi, M. Rautiainen. *A study on the drivers of canopy reflectance variability in a boreal forest*. Remote Sensing Letters, 9(7), 666 – 675, 2018.
- Hadi, M. Pfeifer, L. Korhonen, C. Wheeler, M. Rautiainen. *Forest canopy structure and reflectance in humid tropical Borneo: a physically-based interpretation using spectral invariants*. Remote Sensing of Environment, 201, 314 – 330, 2017.
- L. Korhonen, Hadi, P. Packalen, M. Rautiainen. *Comparison of Sentinel-2 and Landsat 8 in the estimation of boreal forest canopy cover and leaf area index*. Remote Sensing of Environment, 195, 259 – 274, 2017.
- Hadi, L. Korhonen, A. Hovi, P. Rönholm, M. Rautiainen. *The accuracy of large-area forest canopy cover estimation using Landsat in boreal region*. International Journal of Applied Earth Observation and Geoinformation, 53, 118 – 127, 2016.