Abdelaziz KALLEL RESUME

Date of birth 11/04/1980 in Sfax, Tunisia **Nationality: Tunisian**

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Pr. Abdelaziz Kallel received the HDR degree from the Sfax University, Tunisia, in 2014. In 2007, he obtained the Ph.D. degree in physics from the Paris-Sud University, France. He got the engineering and M.S. degrees in telecoms from Sup'Com, Tunisia, in 2003 and 2004, respectively. He was a post doc scientist at LSCE, France and Tartu Observatory, Estonia, in 2008 and 2009, respectively. He is currently a senior researcher of remote sensing at Digital Research Centre of Sfax, Tunisia. Particularly, he is the head of the Remote Sensing for Smart Agriculture (RSSA) Team as well as the Laboratory of Signals, systeMs, aRtificial Intelligence and neTworkS (SMARTS). He was the coordinator of the PHC-Utique project (2017-2019): Olive tree monitoring using optical space born instruments as well as the PAQ-Collabora project (2018-2021): Use of ICT in olive growing: toward optimization of water use and regularity of harvests. He is the coordinator of the federated project (2019-2022): SOS-Olivier: Multi-Approach Monitoring of Olive tree Health in Tunisia using Optical Remote Sensing. He is the scientific coordinator of the Orange group research project (2020-2021) 3A : AI for Agriculture in Africa. His research interest concerns radiative transfer theory and application to vegetation (crop, plant, forest, …) cover property inversion using passive and active optical remote sensing techniques.

Employment

Sept-Oct 2023	**Visiting Professor at Paul Sabatier University:** Jacobien in 3-D Radiative Transfer model
Nov-Dec 2022	**Visiting Professor at EUR TESS:** DART and Energy Budget
May-Jun 2022	**Visiting Professor at Paul Sabatier University:** 3-D Radiative Transfer Modeling and Energy Budget
From Mar. 2021	**Head of the laboratory SMARTS**: Laboratory of Signals, systeMs, aRtificial Intelligence and neTworkS
From Sep. 2016	**Head of the team RSSA**: Remote sensing for smart agriculture
From Sep. 2015	**Senior researcher at Digital Research Center of Sfax**: Remote sensing
November 2015	**Visiting Professor at Paul Sabatier University:** 3-D Vectorial Radiative Transfer Modeling
March 2012	**Visiting Professor at Paris 11 University:** data fusion and application
2010–2015	**Professor at Higher Institute of Electronic and Communication of Sfax:** Signal and image processing
2009–2010	**Professor at "El Manar" Preparatory Institute for Scientific and Engineering Studies:** Automatics
2008–2009	**Post Doc in (Tartu Observatory):** « Vegetation Radiative Transfer Modeling»
Jan-May 2008	**Post Doc in (LSCE/CNRS):** «Spatial surface temperature downscaling from multisource data»

Education

2004–2007	**PHD Thesis in (CETP/CNRS):** High resolution Red/Infrared Satellite image inversion applied to winter vegetation cover monitoring based on radiative transfer modelling
2003–2004	**Master Stage in (CETP /CNRS):** Characterization of Niamey site (Niger) by high resolution remote sensing instruments (AMMA Project)
2002–2003	**Ecole Supérieure des Communications (Sup'Com Tunis):** MASTER OF TELECOMMUNICATION Option Signals & Images
2000–2003	**Ecole Supérieure des Communications (Sup'Com Tunis):** Multimedia: Signals & Images

Research project

2023–2024	**Coordinator of the CRNS-CHO company partnership project:** ERENGC: Olive tree Yield estimation
2021–2022	**Coordinator of the CRNS-SGT partnership project:** ERENGC: Great Crop Yield estimation in Tunisia
2020–2024	**Scientific coordinator of the CRNS-Orange partnership project:** 3A: AI for Agriculture in Africa (olive tree disease detection)
2019–2024	**Coordinator of the PRF project :** SOS-Olivier: early stage disease detection
2018–2024	**Coordinator of the project PAQ-Collabora :** OptimAgri: water use optimization
2017–2019	**Coordinator of the project PHC-Utique :** SfaxOlivier: olive tree monitoring
2016–2019	**Scientific coordinator of the PRF project:** SMART-Castle: forest scene segmentation
2018–2022	**Participation to the COST ACTION:** SENSECO: fluorescence modeling
2016–2019	**Participation to CPR of CNCT:** Infotel-3: forest inventory

Supervision

Type	PhD	Current PhD	Master	Pro Master	Engineer training
Number	8	1	5	2	7

Scientific publications

Type	Book	Chapter	Article	Conferences with act	Conferences without act
Number	3	3	47	40	2

PhD Supervision list

[1] Marwa Hachicha, 2023, "PREDICTION OF PLANT GROWTH USING SATELLITE IMAGE TIME SERIES BASED ON STATISTICAL APPROACHES", *Université de Sfax*, January, 2023.

[2] Ameni Mkaouar, 2022, "Estimation of Forest Foliage Structure Properties using TLS Data Based on Forward-inverse Radiative Transfer Modeling, *Université de Sfax*, 7 July, 2022.

[3] Tayeb Ben Zaneti, 2022 "Contributions to Satellite Image Fusion in the Deep Learning Era," *Université de Sfax*, 2 February 2022.

[4] Hana Abdelmoula, 2021. "Approche Bayésienne et physique pour la modélisation et le suivi des variables biophysiques d'un couvert végétal en utilisant une série d'images satellitaires," *Université de Sfax*. December, 2021.

[5] Sahar Ben Hmida, 2018, Inversion des formes d'ondes LiDAR pour l'estimation des caractéristiques des cultures et des forêts par des techniques probabilistes et variationnelles, *Université de Sfax, Université de Paul Sabatier, France*, December 2018.

[6] Hind Hallabia, 2016, "Approche de Pansharpening en utilisant un Banc de Filtres Ajustés à la Réponse des Capteurs: Vers la Détection Automatique d'Objet," *Université de Sfax*. December, 2016 (co-supervised with A. Ben Hamida).

[7] Rihab Mechri, "Assimilation de données Assimilation des données Désagrégation Filtre particulaire Infrarouge thermique Lisseur particulaire Meteosat Météosat Température Températures des surfaces continentales Terre -- Surface Télédétection," *Université UVSQ*. December, 2014 (co-supervised with C. Ottlé).

[8] T. Dalleji, 2014, "Fusion multi-résolution d'image de télédétection," *Université de Sfax*. June, 2014 (co-supervised with A. Ben Hamida).

Most important Publications

[1] Y. Wang, A. Kallel, N. Lauret, J. Guilleux, E. Chavanon, J-P Gastellu-Etchegorry, 2024, "3D Monte Carlo differentiable radiative transfer with DART," *Remote Sensing of Environment*, **308**, pp. 114201.

[2] A. Mkaouar, A. Kallel, 2024, "Leaf properties estimation enhancement over heterogeneous vegetation by correcting for terrestrial laser scanning beam divergence effect," *Remote Sensing of Environment*, **302**, 113959.

[3] Y. Wang, N. Lauret, O. Regaieg, X. Yang, J. Guilleux, E. Chavanon, A. Kallel, M. Moulana, J. Colin, O. Hagolle, D. Ramon, J-P. Gastellu-Etchegorry, 2024, "3D Monte Carlo surface-atmosphere radiative transfer modelling with DART," *Remote Sensing of Environment*, **301**, 113946.

[4] T. Ben Zaneti, A. Kallel, Y. Kessentini, 2024, "STF-Trans: A two-stream spatiotemporal fusion transformer for very high-resolution satellites images," *Neurocomputing,* 126868, DOI: 10.1016/j.neucom.2023.126868.

[5] A. Makhloufi, A. Kallel, 2023, "Inversion of a New Designed ANN-Based 3-D-RTM Emulator by Continuous MCMC Technique to Monitor Crop Biophysical Properties Using Sentinel-2 Images," *IEEE Transactions on Geosciences and Remote Sensing,* **61**, 4406714,10.1109/TGRS.2023.3297363.

[6] A. Kallel, M. Dalla Mura, S. Fakhfakh, N. Ben Romdhane, 2023, "Physics-based fusion of Sentinel-2 and Sentinel-3 for higher resolution vegetation monitoring," *IEEE Transactions on Geosciences and Remote Sensing,* **61**, 5403317, 10.1109/TGRS.2023.3257219.

[7] T. Ben Zaneti, Y. Kessentini, A. Kallel, 2023, "Spectral-Temporal Fusion of Satellite Images Via an End-to-End Two-Stream Attention With an Effective Reconstruction Network," *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing,* **1XX**, DOI: 10.1109/JSTARS.2023.3234722.

[8] T. Ben Zaneti, Y. Kessentini, A. Kallel, 2022, "Pansharpening Approach via Two-stream Detail Injection Based on Relativistic Generative Adversarial Networks," *Expert Systems with Applications,* **188**, 115996.

[9] H. Abdelmoula, A. Kallel, J. L. Roujean, J. P. Gastellu-Etchegorry, 2021, "DYNAMIC RETRIEVAL OF OLIVE TREE PROPERTIES USING BAYESIAN MODEL AND SENTINEL-2 IMAGES", *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, **14**, pp 9267 – 9286.

[10] A. Makhloufi, A. Kallel, R. Chaker, J. P. Gastellu-Etchegorry, 2021, "RETRIEVAL OF OLIVE TREE BIOPHYSICAL PROPERTIES FROM SENTINEL-2 TIME SERIES BASED ON PHYSICAL MODELING AND MACHINE LEARNING TECHNIQUE", *International Journal of Remote Sensing*, **43**, pp. 1-15.

[11] S. Chaabouni, A. Kallel, R. Houborg, 2021, "Improving retrieval of crop biophysical properties in dryland areas using a multi-scale variational RTM inversion approach", *International Journal of Applied Earth Observation and Geoinformation*, **94**, pp. 102220. https://doi.org/10.1016/j.jag.2020.102220.

[12] A. Kallel, 2020, "FluLCVRT: reflectance and Fluorescence of Leaf and Canopy modeling based on Monte Carlo Vector Radiative Transfer simulation", *Journal of Quantitative Spectroscopy & Radiative Transfer*, **253C**, pp. 107183

[13] A. Kallel, 2020, "Two-scale Monte Carlo ray tracing for canopy-leaf vector radiative transfer coupling", *Journal of Quantitative Spectroscopy & Radiative Transfer*, **243C**, pp. 106815.

[14] S. Chaabane, L. Chaari, A. Kallel, 2020, "Bayesian sparse regularization for parallel MRI reconstruction using Complex Bernoulli-Laplace mixture priors," *Signal image and video processing,* **14**, 445–453.

[15] A. Kallel, 2015, "MTF-adjusted PanSharpening Approach based on Coupled Mutliresolution Decompositions", *IEEE Transactions on Geosciences and Remote Sensing*, **53(6)**, pp. 3124 - 3145.

[16] R. Mechri, C. Ottlé, O. Pannekoucke, A. Kallel, 2014, "A new methodology for downscaling low spatial resolution Land Surface Temperature: Genetic Particle Filter", *Journal of Geophysical Research - Atmospheres*, **119**, pp. 1-16, **10.1002/2013JD023054**.

[17] A. Kallel, Ottlé, S. Le Hégarat, 2013, "Surface temperature downscaling from low resolution thermal measurement based on the MAP criterion and Markov models", *IEEE Transactions on Geosciences and Remote Sensing*, **51(3)**, pp.1588-1612.

[18] A. Kallel, W. Verhoef, S. Le Hégarat-Mascle, C. Ottlé, L. Hubert-Moy, 2008, "Canopy Bidirectional Refectance calculation based on Adding method and SAIL formalism: AddingS/AddingSD", *Remote Sensing of Environment*, **112**, pp.3639–3655.