

BIOGRAPHY



ADRIANO ARAÚJO GOMES

Faculty of Chemical and
Food Technology STU

Project number
2125/01/02

Project duration
10/2022 - 12/2023

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"Beyond to the obvious possibility that is to make science on a high scientific and social level, SASPRO 2 is like a bridge that connects people from different and distant parts of the world to contribute to a better world together."

Adriano A. Gomes is an expert in analytical chemistry and data science, currently the focus of her career is the application and development of machine learning tools and artificial intelligence in the development of fast, safe, robust, non-destructive and non-invasive analytical methodologies combining spectroscopic methods such as molecular fluorescence 3D, Infrared, Raman, UV-Vis and Computational Vision/Digital Imaging for Food Authenticity and Integrity Analysis.

PROJECT SUMMARY

Green analytical approaches for quality control of wine on digital image and chemometrics - GWICVCA

The possibility of quick analysis, with robustness, non-destructive and potential for portability is essential to make quality control in the industry an easier task. In the wine industry this is no different because the winemaking process involves many steps that require chemical analysis ranging from the grape delivery to the final product. In recent years, much attention has been paid to analytical methods based on spectral techniques combined with chemometrics tools, as these approaches are able to overcome many drawbacks of traditional methods of analysis. More recently, articles in the literature have shown the potential of so-called analytical methods based on computer vision or digital images. The digital image carries chemical, physical-chemical and textural composition information from a sample that with the use of correct models can be converted into useful information for decision making in a factory's routine laboratory. Visually a human being is able to make many inferences about the quality of a food just by being visually inspected, now think of an image captured by a high resolution camera under controlled lighting conditions combined by sophisticated chemometric algorithms. In this context it is proposed the use of images and chemometrics to develop new analytical methods to be applied in the quality control of the wine production chain. Deliverables were divided into five work packages and included development of methods of analysis and software used for the process of images in wine analysis. These new methods, in addition to all the advantages already mentioned in general, do not require previous treatment of the sample and do not generate residues, therefore they are environmentally friendly.



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PUBLICATIONS

- 1- Gomes, Adriano A.; Azcarate, Silvana M.; Diniz, Paulo Henrique Gonçalves Dias; Souza Fernandes, David D.; Veras, Germano. Variable selection in the chemometric treatment of food data: A tutorial review. *FOOD CHEMISTRY*, v. 370, p. 131072, 2022. <https://doi.org/10.1016/j.foodchem.2021.131072>
- 2- Gomes, Adriano A.; Khvalbota, Onça, Larissa; Machyňáková, Andrea; Špánik, Ivan. Handling multiblock data in wine authenticity by sequentially orthogonalized one class partial least squares. *FOOD CHEMISTRY*, v. 382, p. 132271, 2022. <https://doi.org/10.1016/j.foodchem.2022.132271>
- 3- Vyviurka, Olga; Thai, Ha Anh; Garančovská, Dominika; Gomes, Adriano A.; Špánik, Ivan. Enhanced multi-stir bar sorptive extraction for wine analysis: Alteration in headspace mode. *FOOD RESEARCH INTERNATIONAL*, v. 158, p. 111510, 2022. <https://doi.org/10.1016/j.foodres.2022.111510>
- 4- Vyviurka, Olga; Koljančiča, Nemanja; Gomes, Adriano A.; Špánik, Ivan. Optimization of enantiomer separation in flow-modulated comprehensive two-dimensional gas chromatography by response surface methodology coupled to artificial neural networks: Wine analysis case study. *JOURNAL OF CHROMATOGRAPHY A*, v. 1675, p. 463189, 2022. <https://doi.org/10.1016/j.chroma.2022.463189>
- 5- Junges, Carlos H.; Guerra, Celito C. ; Reis, Natalia A.P.C. ; Gomes, Adriano A.; Diogo, Fernando S.; Ferrão, Marco F. Grape Juice Classification GRAPE JUICE CLASSIFICATION with respect agricultural production system by means of visible spectroscopy chemometric assisted . *JOURNAL OF FOOD COMPOSITION AND ANALYSIS*, V. 114, 2022, p. 10479. <https://doi.org/10.1016/j.jfca.2022.104793>

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