Mario D'Acunto
CNR-IBF, Consiglio Nazionale delle Ricerche, Istituto di Biofisica, Via Moruzzi 1, 56124, Pisa, Italy
Mario.dacunto@ibf.cnr.it

Multivariate Statistics methods for cancer grading

Abstract

In the last decade, Raman Spectroscopy has demonstrated to be a label-free and destructive optical spectroscopy able to improve diagnostic accuracy in cancer diagnosis [1]. This ability is principally based on the great amount of biochemical information dealt out by the Raman scattering with biological tissues under investigation. However, to achieve clinical requirements, the spectroscopic analysis and its ability of grading cancer tissues require sophisticated multivariate statistics [2-3]. In this presentation, we critically review multivariate statistics methods analyzed at the light of their ability to process datasets generated by Raman spectroscopy on chondrogenic tumors where distinguishing between enchondroma and first grade of malignancy is a critical problem for pathologists.

References

[1] D'Acunto, M.; Gaeta, R, Capanna, R.; Franchi, A. Contribution of Raman Spectroscopy to Diagnosis and Grading of Chondrogenic Tumors. *Sci. Rep. (*2020), *10*, 2155. 35
[2] 2. Lui, H.; Zhao, J.; McLean, D.; Zeng, H. Real-time Spectroscopy for *in Vivo* Skin Cancer Diagnosis. *Canc. Res.* (2012), *72*, 36 2491-2500. 37
[3] 3. Davis, L.E.; Shalin, S.C.; Tackett, A.J. Current state of melanoma diagnosis and treatment. *Canc. Biol. Ther.*(2019), *20*, 1366-1379.

Figures

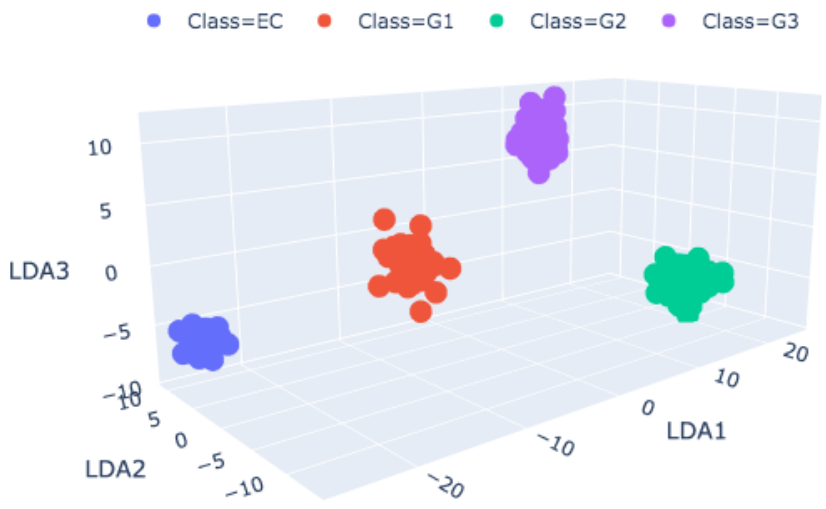

Figure 1: 3D representation of Linear Discriminant Anansyis component for the four Chondosarcoma malignancy groups.