

國立高雄大學統計學研究所
108 學年度書報討論題目暨摘要登記表

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題目：The Shape and Surface Features of Parkinson's SPECT Scans and Their Applications

參考文獻：

1. Iwabuchi, Y., Nakahara, T., Kameyama, M., Yamada, Y., Hashimoto, M., Matsusaka, Y., and Jinzaki, M. (2019). Impact of a combination of quantitative indices representing uptake intensity, shape, and asymmetry in DAT SPECT using machine learning: comparison of different volume of interest settings. *EJNMMI Research*, 9: 7.
2. Morera, D. M. and Sarlabous, J. E. (2013). On the distance from a point to a quadric surface. *Investigación Operacional*, 24(2): 153-161.

摘要：

This study proposes to obtain the optimal ellipse and optimal 3D surface for approximating the 2D- and 3D-SPECT striatum, respectively, by the Particle Swarm Optimization algorithm. The coefficients of the optimal ellipse and 3D surface, together with the characteristics of Parkinson's image identification mentioned in the literature, are employed to learn a Parkinson's disease image classifier under a machine learning framework. The empirical results reveal that the coefficients of the approximate ellipse and the approximate 3D surface are capable of improving the classification accuracy.

Keywords：Parkinson's disease, PSO algorithm, surface function

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