

Li Moyi^{*1}, Browne Ryan P.¹, McNicholas Paul D.¹, Castura John C.²

¹ University of Guelph, Guelph, ON Canada

² Compusense Inc., Guelph, ON Canada

Single-attribute time-intensity (TI) analysis is used to determine how a sensation changes with time for a given product or stimulus. Intensity data from a single TI panelist for one product can be represented as a curve. Although not strictly the case, a TI curve will often monotonically increase then monotonically decrease in intensity. We model this time-dependent behaviour directly using a Markovian error structure. Later, we adapt our methodology to multimodal TI curves by increasing the number of critical points. A variant of the expectation-maximum (EM) algorithm is introduced to estimate the parameters of this model. We conduct a simulation study to investigate the performance of the estimation method under the assumption of homoscedasticity and heteroscedasticity. We apply the proposed method to real TI data obtained from an evaluation on fruity liqueurs. The estimated mean curve is obtained for each panelist. Consequently, using these two different assumptions of standard deviation, the results are consistent. The resulting TI curves can provide useful information of the attributes.

