Yang, Luwei; Chew, Elaine; Rajab, Khalid Z.

Logistic modeling of note transitions.


Summary: Note transitions form an essential part of expressive performances on continuous-pitch instruments. Their existence and precise characteristics are not captured in conventional music notation. This paper focuses on the modeling and representation of note transitions. We compare models of excerpted pitch contours of performed portamenti fitted using a logistic function, a polynomial, a Gaussian, and Fourier Series, each constrained to six coefficients. The logistic model is shown to have the lowest root mean squared error and the highest adjusted $R$-squared value; an ANOVA shows the difference to be significant. Furthermore, the logistic model produces musically meaningful outputs: transition slope, duration, and interval; and, time and pitch of the inflection point. A case study comparing portamenti between erhu and violin on the same musical phrase shows transition intervals to be piece-specific (as it is constrained by the notes in the score) but transition slopes, durations, and inflection points to be performer-specific.

Keywords: logistic model; note transition; portamento; expressive music analysis; performance
doi:10.1007/978-3-319-20603-5_16