Music summarization

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Presentation

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Reference article:

- Title: Automatic Music Summarization via Similarity Analysis
- Authors: Matthew Cooper and Jonathan Foote
- Date: 2002

- Proposed system
- Implementation results
- Discussion of the choices

Method:

- Features extraction in vectors (v_i), i the time index
- Similarity measure: $d_c(v_i, v_j) = \frac{\langle v_i, v_j \rangle}{||v_i||\ ||v_j||}$
- Similarity matrix: $\mathbf{S}(i, j) = d_c(v_i, v_j)$
- Similarity score: $Q_L(i) = \frac{1}{NL} \sum_{m=i}^{i+L} \sum_{n=1}^{N} \mathbf{S}(m, n)$
- Highest score: $q_L^* = \arg\max_{1 \leq i \leq N-L} Q_L(i)$
- Summary excerpt from time q_L^* to $q_L^* + L$

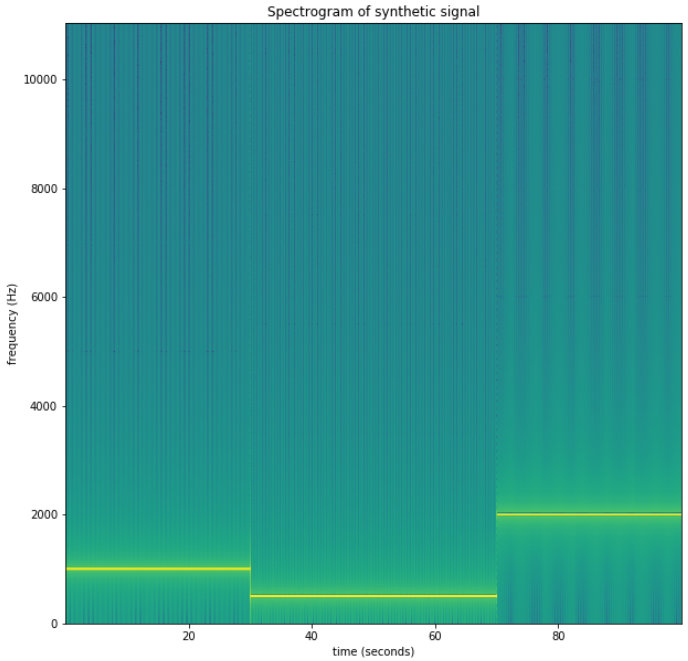

Figure: Spectrogram of the synthetic signal

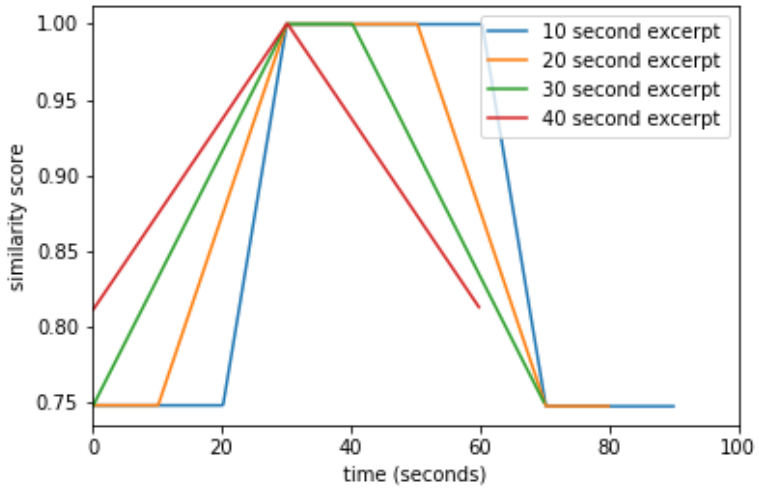

Figure: Summary scores $Q_L(i)$ computed for the synthetic signal for $L = 10, 20, 30,$ and 40 seconds.

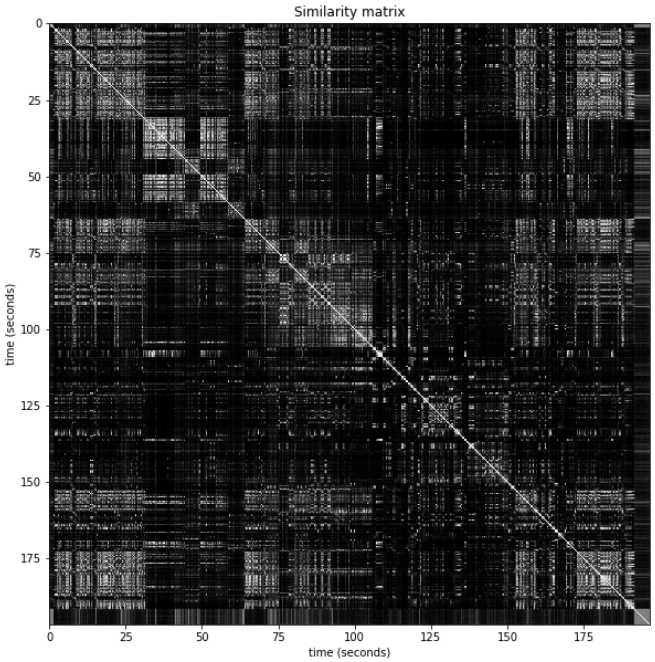

Figure: Similarity matrix for Vivaldi's Spring

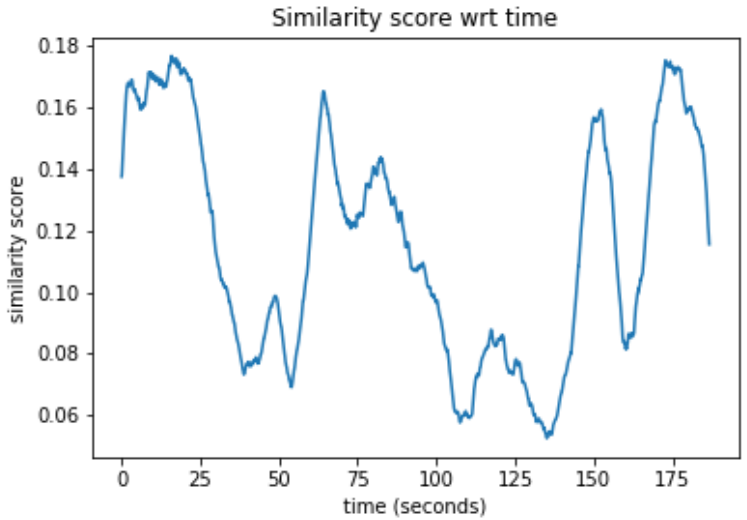

Figure: Summary scores $Q_L(i)$ computed from the similarity matrix of Fig. 3 for $L = 10$ seconds.

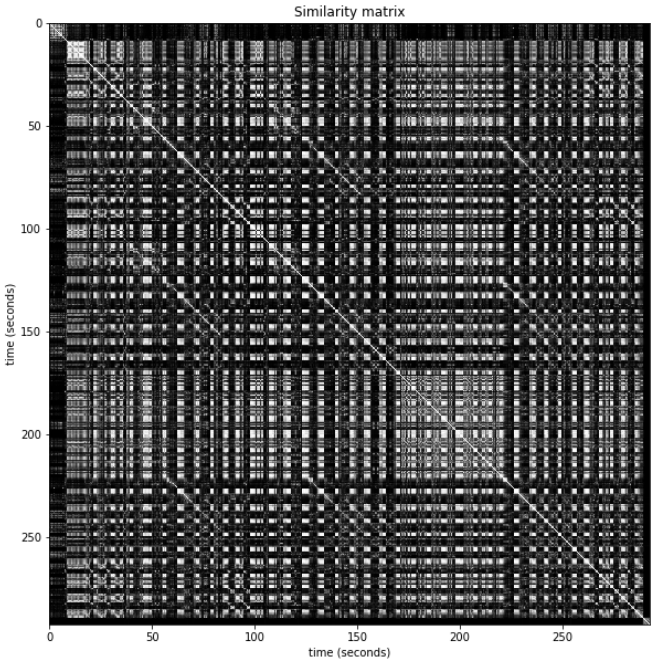

Figure: Similarity matrix for Gimme gimme gimme

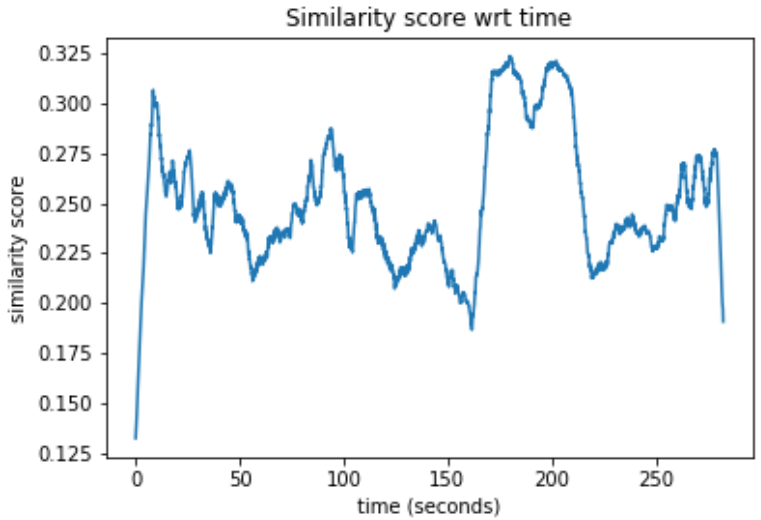

Figure: Summary scores $Q_L(i)$ computed from the similarity matrix of Fig. 5 for $L = 10$ seconds.

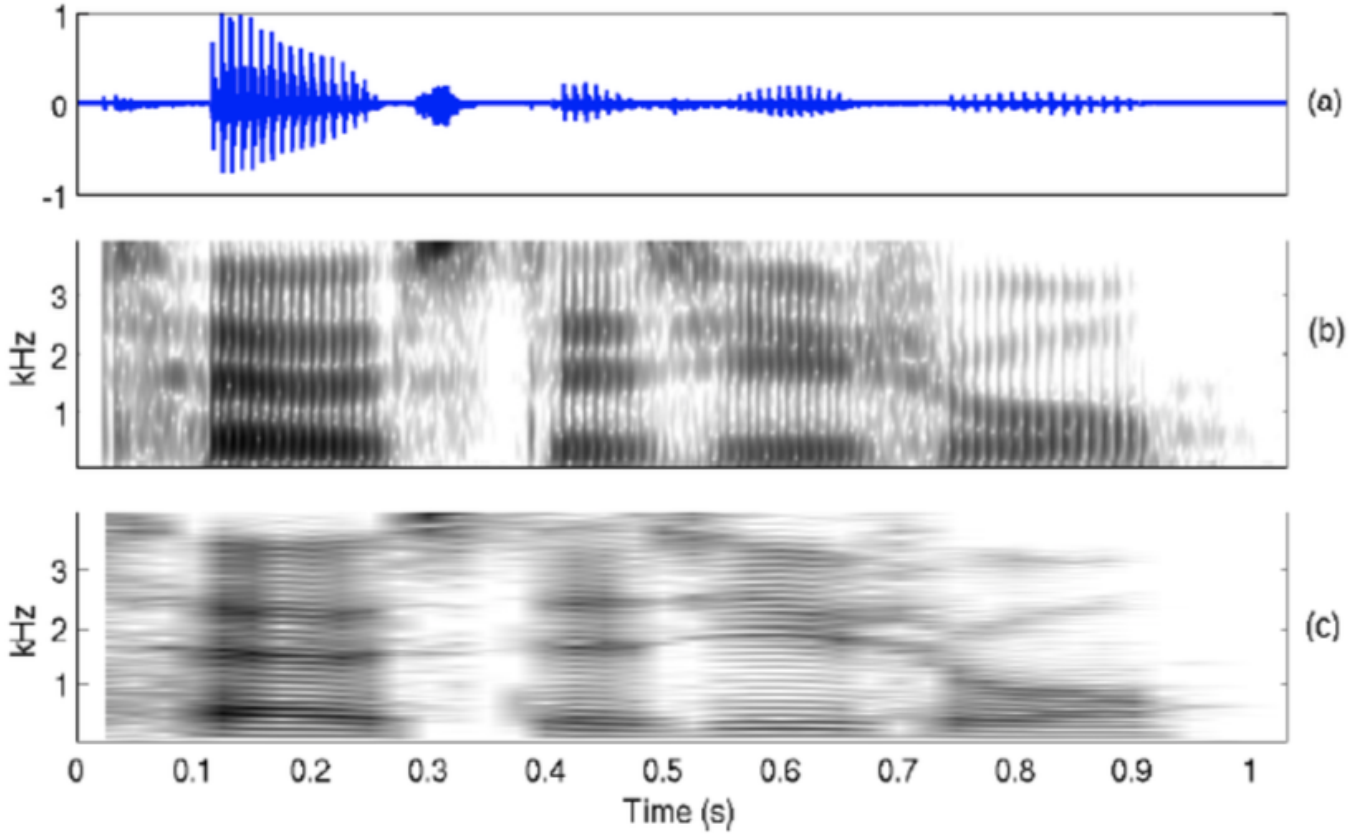

Figure: Spectrogram with narrow versus wide band