VoSA
Voice Separation Analyzer
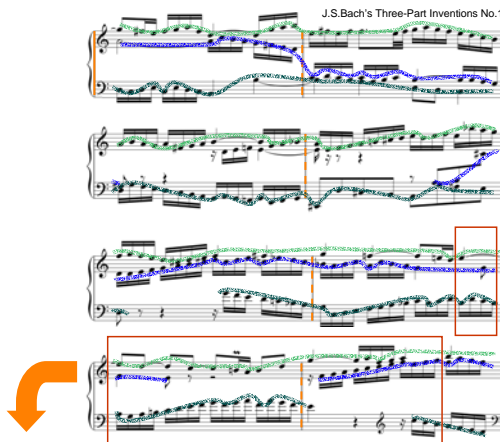
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Research Goal
• Create a robust algorithm to separate voices in polyphonic music using basic principles of music perception.
• Introduce objective measures for evaluating voice separation results.
• Implement and evaluate algorithm in VoSA - Voice Separation Analyzer.

J.S.Bach's Three-Part Inventions No.1

Applications
• Music information retrieval
• Computer analysis of music
• Automatic transcription of music.

Role in IMSC
This project supports IMSC's research in music information management through systematic use of music perception principles.

Research Approach
• **Uniqueness:** Contig Mapping approach.
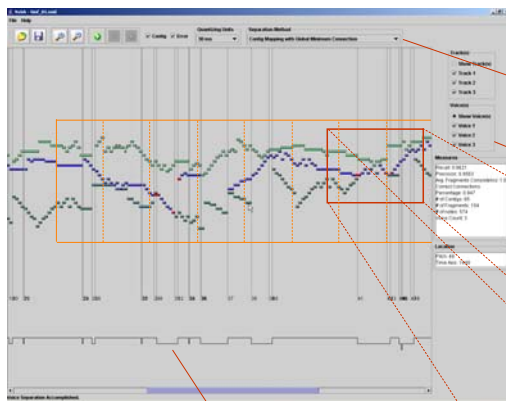• **Software:** developed under Java SDK1.4.2 SE

Accomplishments
• Contig-mapping algorithm for voice separation.
• Adaptive quantization developed to pre-process MIDI.
• Universal measures to evaluate voice separation.
• Algorithm's result: 90% precision on Bach's pieces.

Toolbar
•To choose the quantizing units.
•To choose the separation method.

Track Pane
•To show the midi track(s).
•To show the separated voice(s).
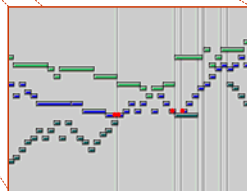•To show the performance measures.

Publication:
Chew, Elaine & Wu, Xiaodan. "Separating Voices in Polyphonic Music: A Contig Mapping Approach." In proc. of Computer Music Modeling and Retrieval, Springer Verlag LNCS #2771, 2004.

Invention + Software Disclosure:
A Contig Mapping Algorithm for Voice Separation (Filed: 5 April, 2004).

Piano Roll View
• To color the different tracks/voices.
• Gray line shows the boundaries of the voice contigs.
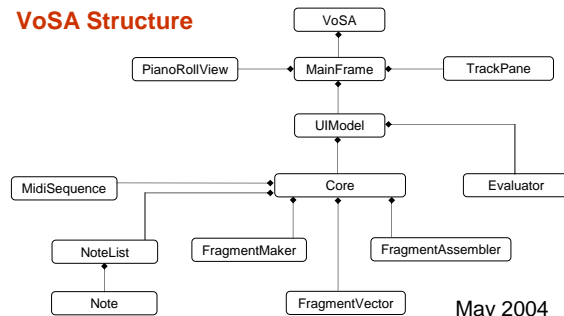• Red dot shows the erroneous contig connections.

Future Work
• Determine when to allow voice crossings.
• Determine if pattern matching can improve the performance of VoSA.
• Apply VoSA to music retrieval systems.

Voice Count Plot
•To give the number of voices detected.

Related Work
• Huron, D. (2001) "Tone and Voice: A Derivation of the Rules of Voice-leading from Perceptual Principles", Music Perception, **19**(1), 2001,pp.1-64.
• Kilian, J. & Hoos, H. (2002) "Voice Separation – A Local Optimization Approach." In Proceedings of the 3rd International Conference on Music Information Retrieval,2002, p.39-46.
• Temperley, D. (2001) "The Cognition of Basic Musical Structures", MIT Press: 2001, pp. 85-114.

VoSA Structure

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