Vmus.net: A Web-based Platform Transforming Music Performance Research

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Originally developed as a **desktop tool in 2004** and evolved into a widely used **web-based platform by 2014**, Vmus.net has significantly influenced musicological research, allowing detailed visualization of tempo, dynamic, and expressive timing. By August 2025, the platform has supported around **5,000 users** and accumulated over **28,000 annotated media files**.
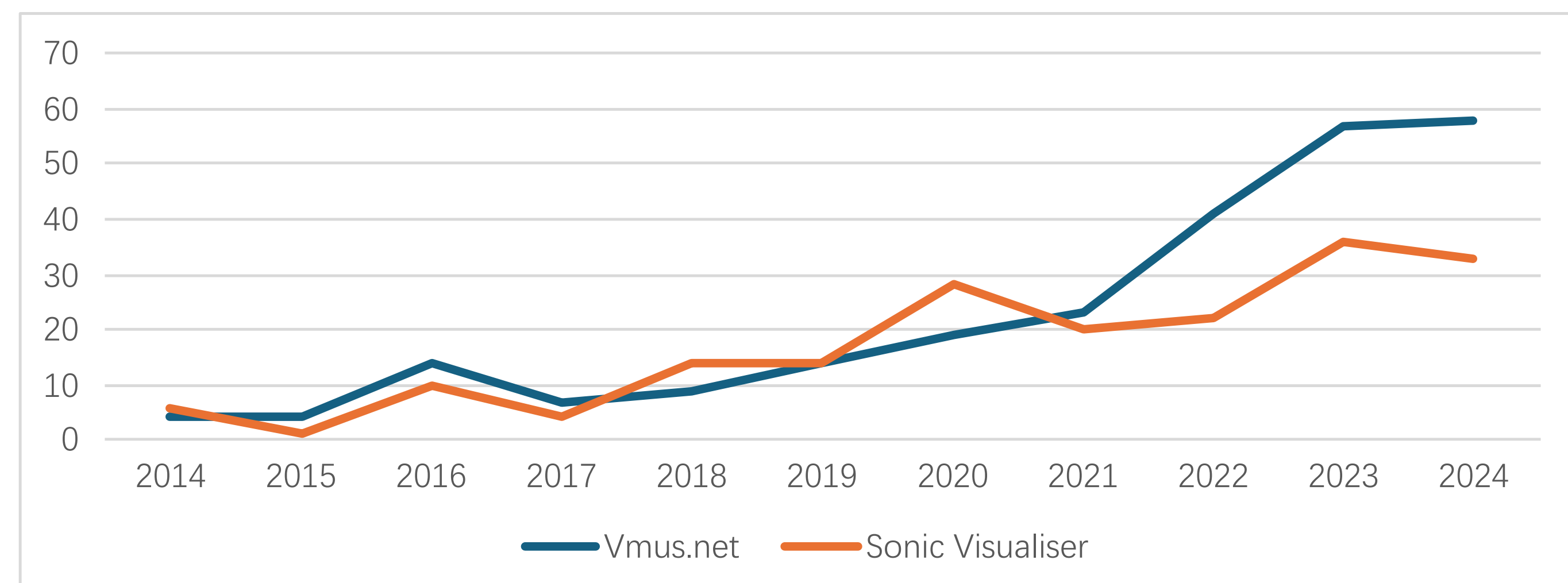

Chinese papers quoting **Vmus.net (264)** and Sonic Visualiser (195) from 2014 to 2024, data collected from cnki.net

Open a media file locally or remotely.
Play with different speed (0.25 - 4x).

Import and export csv compatible with Sonic Visualiser
Automatically **note onset detecting** (Dixon 2007...)

V3beta
(**v3.vmus.net**) is now available as a standalone demo, in which no registration/ login is needed and files are accessed locally.

Waveform: Amplitude vs time.
Spectrogram: Frequency vs time.
**Beat annotation**: beat points annotated automatically or manually by tapping A/S/D/F.
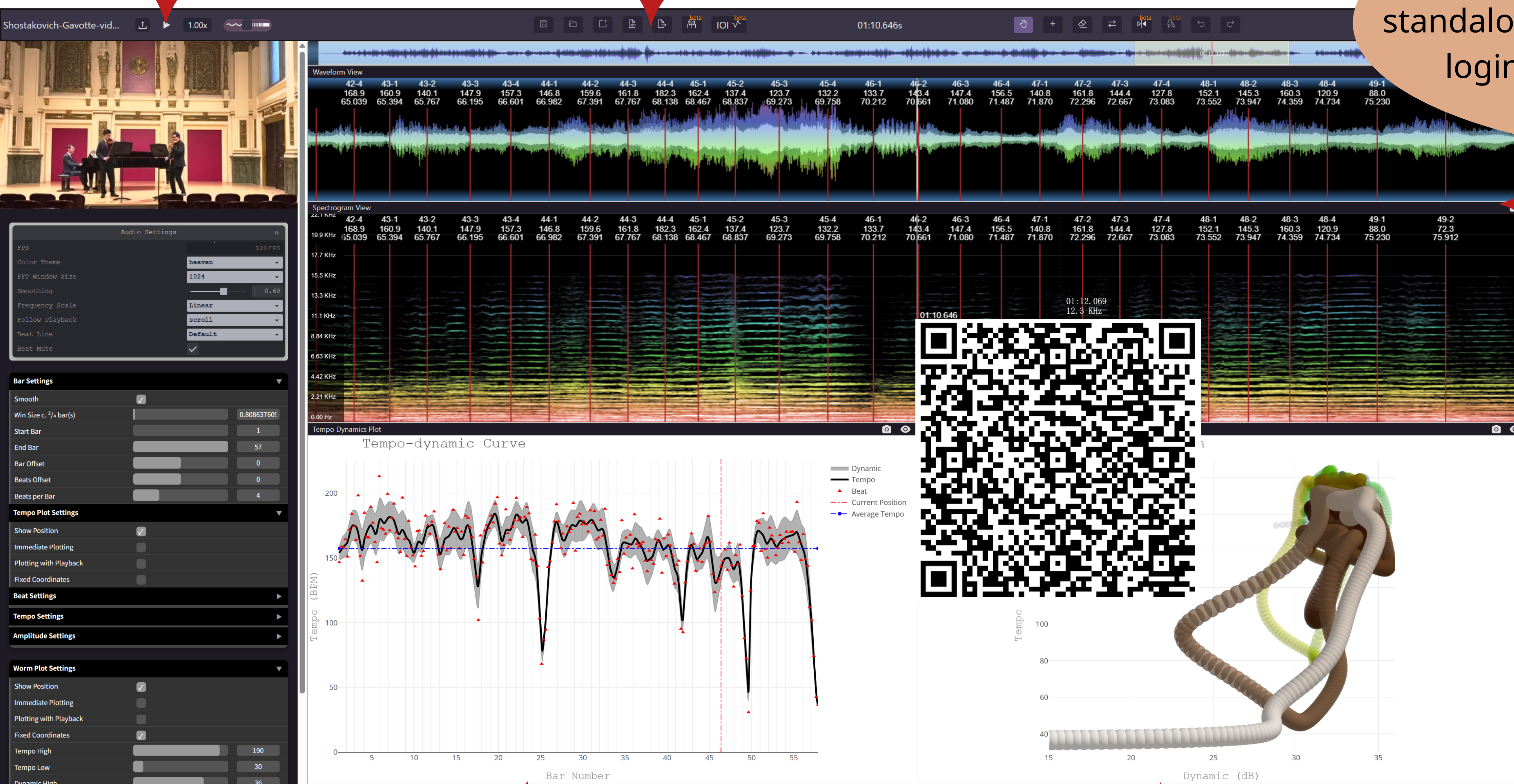
Settings:
FFT window size for spectrogram...
Beat per Bar...
Tempo smoothing window size...
Immediately (Realtime) plotting...

Tempo-dynamic curve: the vertical axis represents tempo in beats per minute (BPM) and bar numbers are shown on the horizontal axis. The thickness of the grey bands around the tempo curve indicates the relative dynamics and the dots are the raw tempo data. Tempo curve and dynamic band are both smoothed.

Performance worm: orignally defined by Langner & Goebl 2003, in Vmus.net, the vertical axis is still tempo and the horizontal axis is dynamic. Time is represented with color/grayscale gradient and the width of the worm. It is an effective method for exploring the unique interpretations of different musicians.

IOI deviation curve: showing the percentage difference between the performed inter-onset interval (IOI, the time from one note's onset to the next) and the notated value, indicating whether each note is lengthened (positive) or shortened (negative) relative to the score.

Case Study
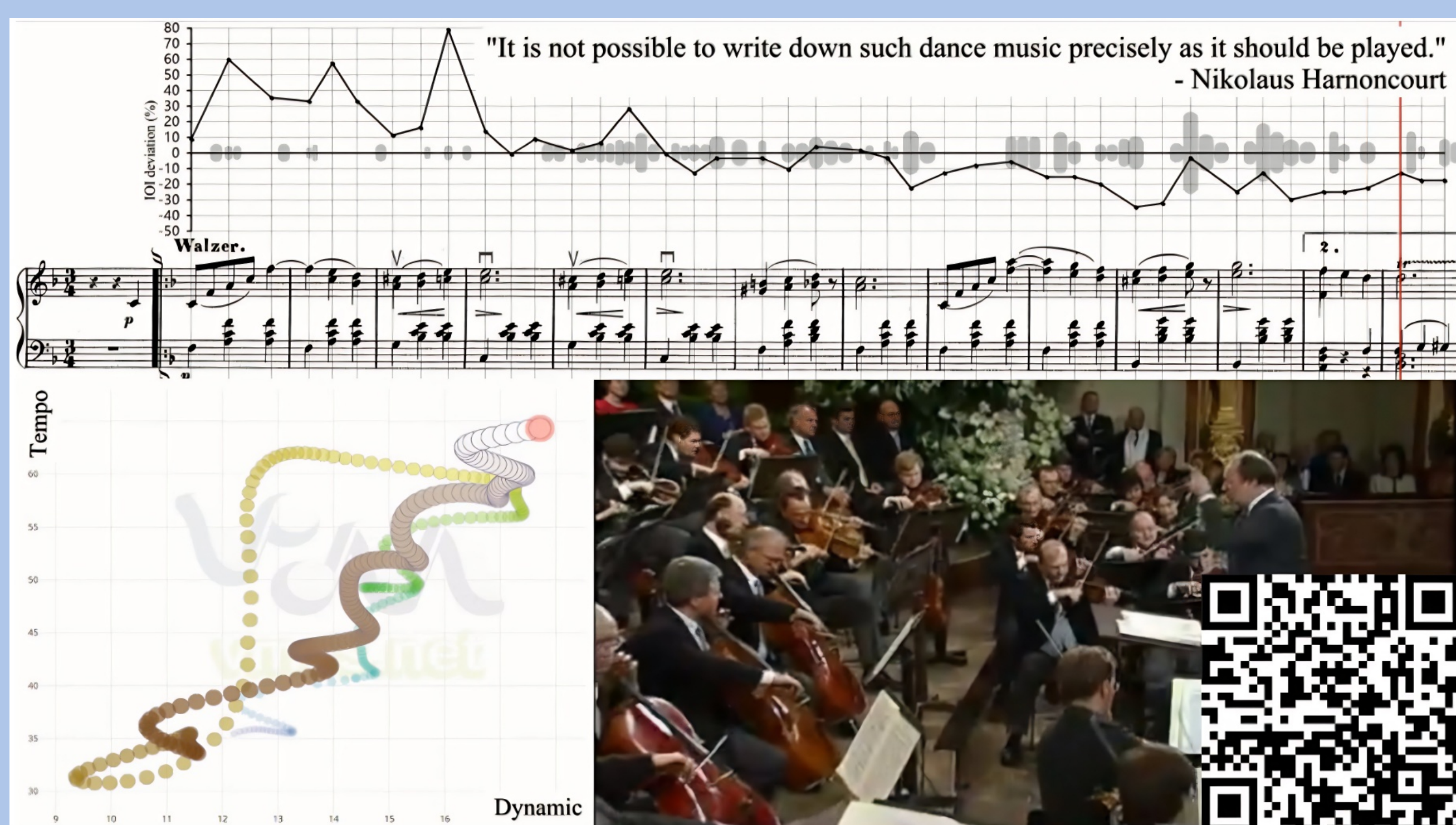
IOI deviation curve and performance worm of 2003-Harnoncourt recording of *The Blue Danube*, https://youtu.be/f1YaA9wovPk

History

	Vmus.net 0.x	Vmus.net 1.x	Vmus.net 2.x	Vmus.net 3.0beta
Year	2004	2014	2020	2025
Users	1	1	1.5k+	5k+
Media Files	/	0	5k+	28k+
Supported Formats	MP3		MP3, AAC, WAV, MP4, MOV...	
Annotation records	/	0	3k+	20k+
Score Images	/	0	1k+	5k+
Frontend	ActionScript 2	ActionScript 3	JavaScript, HTML5	
Backend	/		PHP + MySQL	

Future
1) Automatic alignment of media files with MEI scores.
2) Remote media loading (e.g., YouTube) and URL sharing.
3) Video gesture tracking alongside audio features.