

“Mathematical problems underlying Sony music research”

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Abstract:

The music research team at Sony Computer Science Lab in Paris has been developing for several years research projects devoted to music intelligence.

The goal is to design computer software that understand enough of music to create “interesting” interactions with non professional users.

Several projects have been developed in this respect with different types of experiments aiming at demonstrating the potential interest of these ideas.

I will describe these projects by focussing on the underlying mathematical problems that we encountered, hoping that some of them are of interest for the Mathematical community.

These projects include

- 1) real time music spatialization with constraints (how to restore quickly the stability of a system with non linear constraints)
- 2) assisted music improvization (how to model recurring patterns in real time music performances and generate musically meaningful sentences)
- 3) music classification (what are good signal features, and what is the topology of the feature space?).