Well-Tempered P Systems:
Towards a Membrane Computing Environment
for Music Composition

Adam Obtułowicz

Institute of Mathematics, Polish Academy of Sciences,
Śniadeckich 8, P.O.Box 21, 00-956 Warsaw, Poland
e-mail: adamo@impan.gov.pl

Summary. A proposal of designing a membrane computing environment for music composition is outlined.

1 Introduction

We outline a proposal of designing a membrane computing environment for music composition, where a basic theoretical concept for this environment is a notion of a well-tempered P system with the adjective "well-tempered" understood here in a similar way as in the title of *Well-tempered computer* of [12] and with the notion of a P system defined as in [9]. The notion of a well-tempered P system is explained in the next section as a result of a synthesis of some known concepts.

2 Well-tempered P systems

The notion of a well-tempered P system is proposed to be a result of synthesis of the following known concepts, ideas, and notions:

— the notion of a λP system due to N. Jonoska and M. Margenstern, cf. [1] and [6],
— a concept of a music score, written or analyzed, in terms of music calculi having common features with (type-free) lambda calculus, cf. [8] and [7],
— the idea of sounding P system, cf. [3],

with a regard to M. Steedman's categorical grammar approach to jazz improvisation, cf. [13].

More precisely, a well-tempered P system is aimed to represent a score of a music piece, e,g. fuge, written in terms of a music calculus, cf. [8] and [7], like λP systems represent λ terms, respectively, where a reduction process of a λ term

corresponds to an evolution process generated by the lambda P system representing this λ term, cf. [1] and [6].

We do not exclude other approaches to the notion of a well-tempered P system, where:

— a P system for modelling higher plants, cf. [10], could represent a score of music piece expanding in time like plants with some probability factor like in [5],
— a P system for fractal generation, cf. [4], could represent a score of music piece expanding in time like cellular automata generating fractals, cf. [11].

Therefore the P-Lingua tools, cf. [2] and [14], could provide an appropriate software for an environment for music composition designed in the frames of membrane computing by using well-tempered P systems.

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