

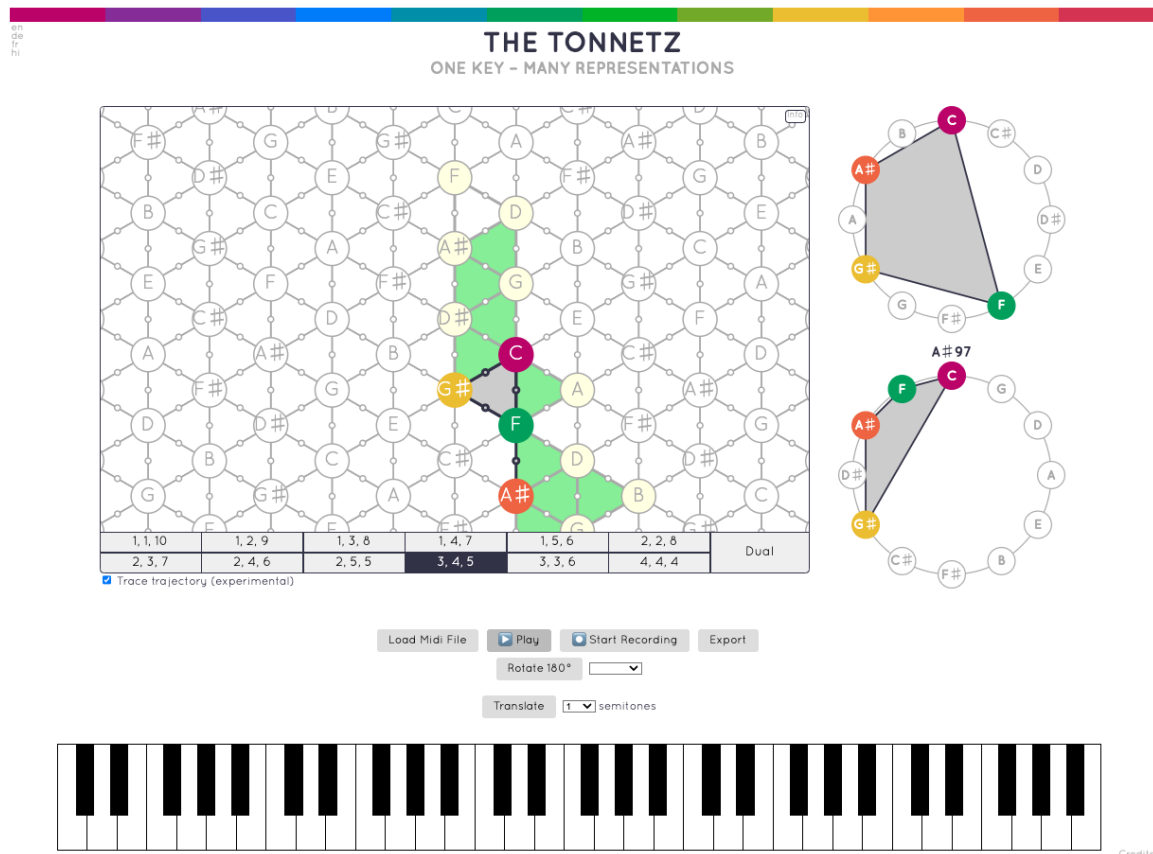
The Music of Maths: rules and constraints in song writing

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In this recital-conference I would like to focus on some compositional experiences that are directly linked to the theoretical and compositional reflections I'm carrying on since 2016 within the SMIR (Structural Music Information Research) Team-Project at the University of Strasbourg. Although many of the ideas concerning the use of rules and constraints in song writing were developed initially during the first years of my research within the Music Representation Team at IRCAM (the Institute of Research and Coordination in Acoustics/Music, in Paris), the discussion I had in the last years with mathematicians, musicologists and composers had a big influence on the way in which the theoretical ideas were applied to music composition via a computational approach. In particular, a new environment – called *Tonnetz* – has been developed enabling to control the harmonic organization in the song writing process by using two main geometrical representations: the circular representation and the triangular/hexagonal tiling of the plane known as “Tonnetz”. The catalogue of Hamiltonian Cycles in the Tonnetz provided the main starting point for several experiences in the field of

Hamiltonian Songs all composed by putting poetry into music (e.g. *Aprile*, on a text by Gabriele D'Annunzio, *La sera non è più la tua canzone*, on a text by Mario Luzi, *A part*, on a text by Andrée Chérid, ...). In addition to all these pieces based on the theory of Hamiltonian paths and cycles in graphs structures, I will present two songs based on permutational techniques: *Una volta soltanto una storia d'amore finisce* (a one-note song based on one single sentence and its possible permutations) and the very recent *Antes, después* (based on a permutational text of Julio Cortazar). By taking all these "mathemusical" experiences as a starting point, I will try to open a discussion on the underlying structural properties of songs and the possibility of exceeding these limits by using mathematically-based rules and constraints.

Biography:

Moreno Andreatta is a CNRS senior researcher in mathematics and music at the Institute of Research in Advanced Mathematics (IRMA) in Strasbourg and also associate researcher at IRCAM in Paris. A founding member of the Society for Mathematics and Computation in Music, he is the head of the SMIR (Structural Music Information Research) team at IRMA. Alongside his scientific activity, Moreno Andreatta has always cultivated his interest for piano improvisation and song writing. He also teaches formal models of songs in the bachelor degree in popular music of the University of Strasbourg. More information on his "mathemusical" activities at: www.morenoandreatta.com.