New concepts may be invented by ‘exploring’ previously unexplored regions of a given conceptual space (exploratory creativity) or by transforming in novel ways established concepts (transformational creativity) or by making associations between conceptual spaces that were previously not directly linked (combinational creativity). Boden maintains that the latter, i.e., combinational creativity, has proved to be the hardest to describe formally (Boden 2009). Conceptual blending is a cognitive theory developed by Fauconier and Turner (2001) that relates to combinational creativity, whereby elements from diverse, but structurally-related, mental spaces are ‘blended’ giving rise to new conceptual spaces.

In this project, we focus on conceptual invention and blending in the domain of musical harmony, following a multidisciplinary perspective that incorporates musicology, artificial intelligence, cognitive science and mathematics. Different musical styles/idioms establish independent harmonic spaces that involve a network of inter-related constituent concepts such as chord, root, scale hierarchy, tonality, harmonic rhythm, harmonic progression, voice-leading, implied harmony, reduction, prolongation etc. Conceptual blending is facilitated when a rich background of concepts is available and when these concepts are structured in such ways that creative mappings are supported. A rich idiom-independent representation of harmonic concepts is proposed: from the ‘primitive’ chord events to a hierarchical multiple-viewpoint representation of harmonic structure that allows ‘meaningful’ blends at various hierarchic levels of harmony.

We present examples of conceptual blending in musical harmony and formal models that generate novel harmonic blends in the following harmonic domains:

1. Chord–level: Individual chords that share common properties are blended giving rise to novel instances of chord functions (e.g. blending the chords that take part in a cadence).
2. Chord–sequence level: sequences of chords from different idioms are blended in a musically meaningful manner, creating sequences of different degrees of originality.
3. Harmonic structure level: different levels of harmonic structure from different harmonic spaces (i.e., different levels of induced probabilistic grammars) are combined generating ‘coherent’ new blends (e.g. phrase–level endings from one style combined with low–level chord transitions from another style).
4. Melody – harmony level: Features characterising a given melody are blended with features of a different harmonic space allowing the generation of novel melodic harmonisations (such high–level features embody various structural properties and, additionally, extra–musical features such as mood, motion, tension, shape etc.).