Reconstruction of digitally convex polyominoes

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In this talk we study the tomographical aspects of digitally convex polyminoes. A polyomino P is said digitally convex if its convex hull contains no integer point outside P. A nice result by Brlek, Lachaud, Provençal and Reutenauer gives a link between digitally convex notion and combinatorics on words. Indeed, a polyomino P is described by its boundary word b. The boundary word b could be divided in 4 monotone paths and we compute the Lyndon factorization of each path. If each of these factorizations contains only Christoffel words then we have a digitally convex polyomino. We will use these notions to propose an algorithm to reconstruct (if possible) a digitally convex polyomino from horizontal and vertical vectors of projection.