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Sommario/riassunto	This book proposes a semi-discrete version of the theory of Petitot and Citti-Sarti, leading to a left-invariant structure over the group SE(2,N), restricted to a finite number of rotations. This apparently very simple group is in fact quite atypical: it is maximally almost periodic, which leads to much simpler harmonic analysis compared to SE(2). Based upon this semi-discrete model, the authors improve on previous image-reconstruction algorithms and develop a pattern-recognition theory that also leads to very efficient algorithms in practice.