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Picture languages: tiling systems versus tile rewriting grammars. (English) Zbl 1160.68392

Summary: Two formal models of pictures, i.e., two dimensional (2D) languages are compared: tiling systems and tile rewriting grammars, which resp. extend to 2D the regular and context-free languages. Two results extending classical language properties into 2D are proved. First, non-recursive tile writing grammars (TRG) coincide with tiling systems (TS). Second, non-self-embedding TRG are suitably defined as corner grammars, showing that they generate TS languages. The proofs exploit newly introduced language substitutions, also nested and iterated.

MSC: 68Q42 Grammars and rewriting systems

Keywords: picture language; picture grammar; 2D language; tiling system; recognizable picture language; tile rewriting grammar; 2D regular expression; autoinclusive derivation

Full Text: DOI

References:

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