

# ltxpprt with \usepackage{algpseudocode} for SIAM IMR

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## Abstract

An abstract is a brief summary of the paper's contributions, written for experts. We give an example tex file that typesets pseudocode using the package algpseudocode, for SIAM IMR papers and research notes, etc.

## 1 Introduction

An introduction is a gentler description and summary of the paper than the abstract, written for non-experts. It describes the paper's concepts, contribution, context and significance. Open the algpsuedocode.tex file in a L<sup>A</sup>T<sub>E</sub>X or plain text editor for a working example of how to typeset pseudocode.

## 2 Algorithm

ALGORITHM 2.1. (DETERMINISTIC-MPS) maximal Poisson-disk sampling

**Require:** Rectangular grid  $\mathcal{G}$  of whole grid squares  
**Require:** Flag if domain is periodic: **True** or **False**  
**Ensure:** Maximal Poisson-disk sampling of rectangle

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1: function DETERMINISTIC-MPS( $\mathcal{G}$ )
2:   // Initialize Grid  $\mathcal{G}$ 
3:   for  $g \in \mathcal{G}$  do
4:      $g.\text{point} = (u, v)$  uniform random in square
5:      $g.\text{time} = Ae^{-Aw}$ , rand  $w$ , expovariate in area
6:      $g.\text{scooped-square} = \text{square polygon } g$ 
7:   end for
8:   Global pre-pass heuristic
9:   // Find locally-early squares
10:  for  $g \in \mathcal{G}$  and  $h \in \text{neighbors}(g)$  do
11:    increment #antecedents of  $g$  or  $h$  (later)
12:  end for
13:  for  $g \in \mathcal{G}$  do
14:    EarlySquares.add( $g$  if no antecedents)
15:  end for
16:  // Accept samples and update
17:  repeat
18:     $g = \text{EarlySquares.pop}()$   $\triangleright$  any order
19:    accept  $g.\text{point}$  as Poisson-disk sample
20:    for  $h \in \text{neighbors}(g)$  do
21:      decrement  $h.\text{antecedents}$   $\triangleright$   $g$  no longer
        blocks  $h$ 
22:    // resample candidates covered by
        disk( $g.\text{point}$ )

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23:   if  $h.\text{point} \in \text{disk}(g.\text{point})$  then
24:      $h.\text{scooped-square} \leftarrow \text{disk}(g.\text{point})$ 
25:     if  $h.\text{scooped-square}$  is empty then
26:        $h.\text{time} = \infty$ 
27:     else
28:       trim chocks from  $h.\text{scooped-square}$ 
29:       triangulate remaining polygon
30:       pick  $U \in \{\text{chocks, triangles}\}$  by
        area
31:       sample  $h.\text{point} \in U$  uniform by
        area
32:        $h.\text{time} \quad += \quad \text{expovar}(\text{A}(h.\text{scooped-square}))$ 
33:     end if
34:     for  $s \in \text{neighbors}(h)$  do
35:       if  $h$  is later than  $s$ , but used to be
        earlier then
36:         increment  $h.\text{antecedents}$ 
37:         decrement  $s.\text{antecedents}$ 
38:         EarlySquares.add(  $s$  if no an-
        tecedents )
39:       end if
40:     end for
41:     end if
42:     EarlySquares.add(  $h$  if no antecedents )
43:   end for
44:   until EarlySquares == empty
45: end function

```

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