A study on geometric transformation preserving grid points and its applications

1993 Fiscal Year Final Research Report Summary

A STUDY ON GEOMETRIC TRANSFORMATION PRESERVING GRID POINTS AND ITS APPLICATIONS

Research Project

Project/Area Number

04650331

Research Category

Grant-in-Aid for General Scientific Research (C)

Allocation Type

Single-year Grants

Research Field

情報工学

Research Institution

OSAKA ELECTRO-COMMUNICATION UNIVERSITY

Principal Investigator

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Keywords

Computational Geometry / Algorithm / Computational Complexity / Computer Graphics / Integer Programming

Research Abstract

In this research we have developed efficient algorithms for reporting all the grid points within a given convex polygon in optimal time and also applied the algorithm for two-dimensional integer programming. We have also implemented those algorithms using C language and evaluated their practical efficiencies.
The results were quite satisfactory. We further extended the similar idea to some other problems : digital halftoning of pictures of multiple brightness levels and that of detecting all possible digital components of a specified curve in a digital picture.

Research Products (13 results)

All Other

All Publications

[Publications] N.Kanamaru,T.Nishizeki,T.Asano: "Efficient Enumeration of Grid Points in a Polygon and its Application to Integer Programming" International Journal of Computational Geometry and Applications. (採録決定).

[Publications] T.Asano,T.Tokuyama: "Algorithms for Projecting Points to Give the Most Uniform Distribution with Applications to Hashing" Algorithmica. 9. 572-590 (1993)

[Publications] T.Asano,T.Tokuyama: "Partial Construction of an Arrangement of Lines and its Application to Optimal Partitioning of Bichromatic Point Set" 電子情報通信学会論文誌(E). (採録決定).

[Publications] T.Asano,A.Hasegawa,T.Roos,D.Ranjan: "Optimal and Approximate Digital Halftoning Algorithms and Their Experimental Evaluation" Proc.of Asian Conference on Computer Vision. 23-25 (1993)

[Publications] T.Asano,N.Katoh: "Number Theory Helps Line Detection in Digital Images" Proc.of International Symposium on Algorithms and Computation. 313-322 (1993)

[Publications] T.Asano,T.Tokuyama: "Circuit Partitioning Algorithms Based on Geometry Model" “Algorithmic Aspects of VLSI Layout",Ed.by D.T.Lee and M.Sarrafzadeh. 199-212 (1993)

[Publications] ""Algorithms for Projecting Points to Give the Most Unifrom Distribution with Applications to Hashing"" Algorithmica. vol.9. 572-590 (1993)

[Publications] Tetsuo Asano and Takeshi Tokuyama: ""Circuit Partitioning Algorithms Based on Geometry Model"" "Algorithmic Aspects of VLSI Layout", edited by D.T.Lee and M.Sarrafzadeh, World Scientific Publishing Co.199-212 (1993)

[Publications] N.Kanamaru, T.Nishizeki and T.Asano: ""Efficient Enumeration of Grid Points in a Polygon and its Application to Integer Programming"" Proc.of International Conference on Integer Programming and Combinatorial Optimization. 61-71 (1992)

[Publications] T.Asano and N.Katoh: ""Number Theory Helps Line Detection in Digital Images"" Proc.International Symposium on Algorithms and Computation. (1993)

[Publications] T.Asano, A.Hasegawa, D.Ranjan and T.Roos: ""Optimal and Approximate Digital Halftoning Algorithms and Their Experimental Evaluation"" Proc.of Asian Conference on Computer Vision. 23-25 (1993)

[Publications] T.Asano and T.Tokuyama: ""Partial Construction of an Arrangement of Lines and its Application to Optimal Partitioning of Bichromatic Point Set"" Trans.of IEICE of Japan. (to appear).

[Publications] N.Kanamaru, T.Nishizeki and T.Asano: ""Efficient Enumeration of Grid Points in a Polygon and its Application to Integer Programming"" International Journal of Computational Geometry and Applications.(to appear).

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