

細胞自動機的介紹及其在土石流災害模擬的初步應用

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摘 要 本文介紹細胞自動機的發展歷史、基本組成單元與理論架構及其種類，及其目前發展應用中的研究範疇。並藉由南投縣信義鄉出水溪土石流災害複雜現象的介紹與細胞自動機的災害境況模擬，顯示細胞自動機可延伸應用的領域。本文內容除強調細胞自動機在複雜自然現象的模擬能力外，並建議細胞自動機在應用上可與其他相關領域如地理資訊系統相結合，以擴展其應用性。此外，利用細胞自動機研究其他複雜自然現象，可經由文中介紹的基本建構步驟，建立欲探討現象的細胞自動機模擬模式。

關鍵詞：細胞自動機、土石流、天然災害、地理資訊系統。

An Introduction of Cellular Automata Theory and Its Preliminary Application on Debris Flow Hazard Simulation

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ABSTRACT An introduction of cellular automata for its developing history, theory, and applicability fields were presented in the paper. A preliminary simulation of Chushui stream debris flow hazard in Nantou county, Taiwan, by cellular automata methodology was presented for revealing the capacity of cellular automata on simulation of complex natural phenomena. The framework to set up a cellular automata simulation was suggested for a beginner to study natural phenomena. The combination of cellular automata with available fields, for example, geography information system, for further applications was suggested.

Key Words: cellular automata, debris flow, natural hazards, GIS.

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