

論文摘要

關鍵詞：網路群體犯罪、BDI 代理人架構、差別接觸理論、社會學習理論、網路科學

本論文所定義之「網路群體犯罪」，不同於組織犯罪般有結構的犯罪團體，亦非為了追求共同利益而合作的共犯夥伴，而是網路使用者自發性互動行為下逐漸浮現的群體近似犯罪行為，並且普遍存在於當今各式各樣的網際網路社群，以各種不同的樣貌與形式展現。本研究以 Sutherland (1978) 提出之差別接觸理論與 Bandura (1977) 提出之社會學習理論為基礎，運用理論相關的元素與概念作為食材與食譜，以 BDI 代理人模式為方法來設計網路群體犯罪之模擬模式，透過動態模擬群體犯罪在不同條件下展現不同之面貌。更運用 Watts (2003) 主張的網路科學概念與分析方法，來分析犯罪關係網絡之特性，本研究藉由控制網路社群之使用者人數 (Size) 與初始犯罪率 (ICR) 來觀察不同組合之下所演化的網路結構差異，並從四個衡量指標：犯罪技能平均數、群聚係數、前 10% 使用者平均連結度、連結度小於 10 之比率，標示演化之網路結構的特徵。研究結果發現：1. 犯罪技能擴散的速度受到 ICR 高低的影響，當 ICR 越高的時候犯罪技能擴散的速度越快，反之，當 ICR 較低的時候犯罪技能擴散速度隨之減緩。2. 當 ICR 超越某一特定臨界值之後，使用者擁有的犯罪技能平均數與所屬社群人數成正向關係。3. ICR 的高低對於群聚係數的高低有反向關係，當 ICR 越高則群聚係數越低，反之，當 ICR 越低時群聚係數越高。4. 社群使用者人數越多的情況下，群聚係數越低。5. 前 10% 使用者的平均連結度有隨著演化次數逐漸增加的趨勢。6. 初始犯罪率的高低與前 10% 使用者的平均連結度成反比關係。7. 不論演化次數、社群人數多寡與初始犯罪率值之高低，均僅有少數犯罪者擁有高度的連結，絕大多數的使用者或犯罪者其連結度數均不高 (符合 power law 分佈)。

Abstract

Keywords : Collective Crime, BDI Architecture, Theory of Differential Association, Theory of Social Learning, Network Science

Collective crime is an emerging phenomenon along with collective intelligence in recent years. It is defined as a form of universally distributed crime originated from spontaneous interaction among community users in this paper. The issues that collective crime addresses focus on deviant or criminal behavior existing in common groups or crowds rather than traditional topics at computer crime or cybercrime. The theories, “differential association” proposed by criminologist Sutherland(1978) and “social learning” proposed by sociologist Bandura(1977), underpin the explanation of collective crime phenomena and the model design of agent-based simulation. The detection function of collective crime consists of the evolving network function based on the micro-simulation and an analysis of the function along with four indicators: average amount of crime skills, average cluster coefficient, average degree of top 10% users, and rate of users with degrees smaller than 10. The research findings are: 1. A community with higher initial crime rate (ICR) results in faster spreading of crime skills. 2. A negative relationship between the community size and the average amounts of crime skills exists, as ICR exceeds a threshold. 3. As ICR gets increasing, the average cluster coefficient gets decreasing, and vice versa. 4. The average cluster coefficient gets decreasing along with increasing community size. 5. The average degree of top 10% users gets increasing along time. 6. A negative relationship exists between ICR and the average degree of the top 10% users. 7. The distribution of the degrees of community users follows the scale-free power law distribution – whatever the network evolution times, community size and ICR are, most of the community users have fewer degrees and only few criminals have pretty high degrees relatively.