

## **1. RESISTING PROXY BASED MIMICKING ATTACKS AND ANTI-ATTACKS IN CYBERSPACE**

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Botnets have become major engines for malicious activities in cyberspace nowadays. To sustain their botnets and disguise their malicious actions, botnet owners are mimicking legitimate cyber behaviour to fly under radar. This poses a critical challenge in anomaly detection. First of all, we establish a semi-Markov model for browsing behaviour. Based on this model it is impossible to detect mimicking attacks based on statistics if the number of active bots of the attacking botnet is sufficiently large. However, we also find it is hard for botnet owners to satisfy the condition to carry out a mimicking attack most of the time. With this new finding, we conclude that mimicking attacks can be discriminated from genuine flash crowds using second order statistical metrics. We define a new fine correlation metrics and show its effectiveness compared to others.

**Index terms:** mimicking, flash crowd attack, detection, second order metrics.

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