

## Accepted Manuscript

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PII: S0140-3664(18)30007-0

DOI: <https://doi.org/10.1016/j.comcom.2018.09.002>

Reference: COMCOM 5771

To appear in: *Computer Communications*

Received date: 4 January 2018

Revised date: 9 July 2018

Accepted date: 11 September 2018



Please cite this article as: D. Sánchez, A. Viejo, Privacy-preserving and advertising-friendly web surfing, *Computer Communications* (2018), <https://doi.org/10.1016/j.comcom.2018.09.002>

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# Privacy-Preserving and Advertising-Friendly Web Surfing

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## Abstract

Behavioral targeting is a technique extensively used by the advertising industry that consists on compiling the interests of the individuals that surf the web by tracking the web sites they visit. This targeting strategy has proven to be, by far, the most effective form of advertising and, nowadays, constitutes the pillar of the Internet business model, in which free content is offered to the users in exchange for showing advertisements. Nevertheless, threatening the privacy of the people by tracking them and gathering their interests and habits is not a minor issue and, in recent years, many users have reacted by installing tools in their browsers that block all connections suspicious of being advertisements. By blocking indiscriminately and systematically, these tools protect the privacy of their users, but also hamper the online advertising business and, hence, endanger the sustainability of the ‘free’ Internet model. To tackle this issue, we propose a system that conciliates users’ privacy during web surfing and the advertising business. Specifically, our proposal empowers the user in the protection of her privacy by allowing her to define her privacy requirements, that is, which user’s interests should be hidden from the advertising platforms and which ones can be revealed. Then, our system selectively blocks or bypasses tracking on the browsed web sites according to their content and the privacy requirements. Our system is also the first that implements simulated browsing sessions as a privacy-preserving measure. Empirical results show that our proposal allows fine grained and user tailored privacy protection, which is also more accurate, responsive and respectful with the Internet business model than related works.

*Keywords:* Privacy, Web surfing, Web tracking, User profiling, Online advertising.

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## 1. Introduction

Since 1995 the penetration of the Internet in the Society has grown dramatically and it has consolidated itself as a main platform of services that has changed the way people communicate, do business or enjoy their leisure time. The entry point for any Internet user is the so-called *web surfing*; this is, navigate through the World Wide Web by means of a web browser, retrieving and consuming web pages filled with information, images, videos and other sorts of content.

Noticing the business opportunity, the advertising industry has deployed important efforts in the digital arena to gather economic benefits from the huge quantity of individuals surfing the web. As a matter of fact, Internet advertising revenues in the US increased a 22% in 2016 from a year earlier to a record of \$12.7 billion, surpassing for the first time in history the amount spent on TV ads [1].

As the revenues of the online advertising industry have grown greatly, their tools for targeting advertisements to the right individuals have also improved significantly. Simple targeting approaches are

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