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Eijk, R.J. van

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References

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- Abse, N. (2012). *IAB Presents Innovations In Web Marketing and Advertising: Big data delivers on campaign promise, Microtargeted political advertising in Election 2012*. IABureau.
- Acar, G., Eubank, C., Englehardt, S., Juarez, M., Narayanan, A., & Diaz, C. (2014). The Web never forgets: Persistent tracking mechanisms in the wild. In *Proceedings of the 2014 ACM SIGSAC Conference on Computer and Communications Security* (pp. 674–689).
- Acar, G., Juarez, M., Nikiforakis, N., Diaz, C., Gürses, S., Piessens, F., & Preneel, B. (2013). FPDetective: dusting the Web for fingerprints. In *Proceedings of the 2013 ACM SIGSAC Conference on Computer & Communications Security* (pp. 1129–1140).
- Adams, C., Fedor, F., Felten, C., Felten, E., Fenton, J., Mayer, J., Ralli, C., Toubiana, V., Turner, D., & Van Eijk, R. (2012, April 14–15). *Tracking Report Card*. [Firefox add-on]. New York, NY: Wall Street Journal. WSJ Data Transparency Code-a-Thon. Retrieved 13 April 2014, from <https://www.hackerleague.org/hackathons/wsj-data-transparency-code-a-thon/hacks/tracking-report-card>
- Alabbas, A., & Bell, J. (2018). *Indexed Database API 2.0*. W3C Recommendation, 30 January 2018. Retrieved 31 January 2018, from <https://www.w3.org/TR/IndexedDB-2/>
- Aleem, M., Ishtiaq, A., Abbasi, S., & Islam, M. (2017). User tracking mechanisms and counter measures. *International Journal of Applied Mathematics, Electronics and Computers*, 5(2), 33–40.
- Alexa (n.d.). *Top 1,000,000 sites*. [ZIP-archive, updated daily]. Alexa Internet Inc. Retrieved from <http://s3.amazonaws.com/alexa-static/top-1m.csv.zip>
- Alexa (2015a, June 20). *How are Alexa's traffic rankings determined?* [FAQ]. Alexa Internet Inc. Retrieved 20 June 2015, from

- <https://support.alexa.com/hc/en-us/articles/200449744-How-are-Alexa-s-traffic-rankings-determined->
- Alexa (2015b, June 20). *What's going on with my Alexa Rank?* [FAQ]. Alexa Internet Inc. Retrieved 20 June 2015, from <https://support.alexa.com/hc/en-us/articles/200449614>
- Al-Fannah, N., Li, W., & Mitchell, C. (2018). Beyond Cookie Monster Amnesia: Real World Persistent Online Tracking. , 21.
- Andersdotter, A., Castex, F., Dubois, N., Hamilton, S., Madelin, R., & Van Eijk, R. (2014, January 21). *Do Not Track, is self-regulation enough?* [Video]. Brussels: Eurpean Parliament. Retrieved 27 January 2014, from http://greenmediabox.eu/archive/2014/01/21/do-not-track/20140121_do-not-track_or.mp4
- Andersdotter, A., & Jensen-Urstad, A. (2016). Evaluating Websites and Their Adherence to Data Protection Principles: Tools and Experiences. In *IFIP International Summer School on Privacy and Identity Management* (pp. 39–51).
- Anderson, C. (2007). *The long tail: how endless choice is creating unlimited demand*. Random House.
- Apple (2005). The WebKit Open Source Project [Computer software manual]. Retrieved 25 June 2015, from <https://www.webkit.org/>
- AppNexus (2017a). *How to Use a Deal ID on AppNexus*. [Documentation]. Retrieved 29 January 2018, from <https://support.sharethrough.com/hc/en-us/articles/115001749003-How-to-Use-a-Deal-ID-on-AppNexus>
- AppNexus (2017b). *Online Advertising and Ad Tech Glossary*. [Wiki]. Retrieved 26 November 2017, from <https://wiki.appnexus.com/display/industry/Online+Advertising+and+Ad+Tech+Glossary>
- AppNexus (2017c). *Ways of Buying Ad Inventory*. [Wiki]. Retrieved 26 November 2017, from <https://wiki.appnexus.com/display/industry/Ways+of+Buying+Ad+Inventory>
- Article 29 Working Party (2010). *Opinion 2/2010 on online behavioural advertising*. (WP 171). Brussels: Article 29 Working Party.
- Article 29 Working Party (2011). *Opinion 13/2011 on Geolocation services on smart mobile device*. (WP 185). Brussels: Article 29 Working Party.
- Article 29 Working Party (2012). *Opinion 04/2012 on Cookie Consent Exemption*. (WP 194). Brussels: Article 29 Working Party.

- Article 29 Working Party (2013a). *Opinion 03/2013 on purpose limitation*. (WP 203). Brussels: Article 29 Working Party.
- Article 29 Working Party (2013b). *Working Document 02/2013 providing guidance on obtaining consent for cookies*. (WP 208). Brussels: Article 29 Working Party.
- Article 29 Working Party (2014a). *Article 29 Data Protection Working Party comments in response to W3C's public consultation on the W3C Last Call Working Draft, 24 April 2014, Tracking Preference Expression (DNT)*. [Letter]. Brussels: Article 29 Working Party.
- Article 29 Working Party (2014b). *Opinion 05/2014 on Anonymisation Techniques*. (WP 216). Brussels: Article 29 Working Party.
- Article 29 Working Party (2014c). *Opinion 9/2014 on the application of Directive 2002/58/EC to device fingerprinting*. (WP 224). Brussels: Article 29 Working Party.
- Article 29 Working Party (2015a). *Cookie sweep combined analysis*. (WP 229). Brussels: Article 29 Working Party.
- Article 29 Working Party (2015b). *Letter from the Art. 29 WP on W3C's public consultation on the W3C Last Call Working Draft, 14 July 2015, Tracking Compliance and Scope*. [Letter]. Brussels: Article 29 Working Party.
- Article 29 Working Party (2018). *Guidelines on consent under Regulation 2016/679*. (WP 259 rev.01). Brussels: Article 29 Working Party.
- Asghari, H., Van Eijk, R., Englehardt, S., Narayanan, A., & Winter, P. (2016). *Cookies, stroopwafels, and tea biscuits: On the many national implementations of the E.U. Cookie directive*. [Working Title, draft paper].
- Audit Bureau of Circulations (2013). *Guide to ABC's Spiders & Robots Service*. Berkhamsted, Hertfordshire: ABC. Retrieved 22 July 2015, from http://www.abc.org.uk/Documents/Spiders%20and%20Robots%20service/Guide_ABC%20Spiders%20%20Robots%20Service_v9.pdf
- Audit Bureau of Circulations (2015). *Reporting Standards Website Traffic*. In *Reporting Standards (JICWEBS)*. Berkhamsted, Hertfordshire: Audit Bureau of Circulations (ABC). Retrieved 17 July 2015, from <http://www.abcstandards.org.uk/images/ABCWebTrafficReportingStandards.pdf>
- Aziz, A., & Telang, R. (2015). *What is a Cookie Worth?* In *14th annual workshop on the economics of information security WEIS2015*. [Preliminary draft].

- Balseiro, S., Feldman, J., Mirrokni, V., & Muthukrishnan, S. (2014). Yield optimization of display advertising with ad exchange. *Management Science*, 60(12), 2886–2907.
- Barabási, A. (2016). *Network science*. Cambridge university press.
- Barnes, R., Schneier, B., Jennings, C., Hardie, T., Trammell, B., Huitema, C., & Borkmann, D. (2015, August). *Confidentiality in the Face of Pervasive Surveillance: A Threat Model and Problem Statement*. Retrieved from <http://tools.ietf.org/rfc/rfc7624.txt> (RFC7624)
- Barrat, A., Barthelemy, M., & Vespignani, A. (2007). The Architecture of Complex Weighted Networks: Measurements and Models. In *Large Scale Structure And Dynamics Of Complex Networks: From Information Technology to Finance and Natural Science* (pp. 67–92). World Scientific.
- Barth, A. (2011, April). *HTTP State Management Mechanism*. Retrieved from <http://tools.ietf.org/rfc/rfc6265.txt> (RFC6265)
- Bashir, M., Arshad, S., Robertson, W., & Wilson, C. (2016). Tracing Information Flows Between Ad Exchanges Using Retargeted Ads. In *USENIX Security Symposium* (pp. 481–496).
- Bashir, M., & Wilson, C. (2018). Diffusion of User Tracking Data in the Online Advertising Ecosystem. *Proceedings on Privacy Enhancing Technologies*, 4, 85–103.
- Basques, K. (2018). Network Analysis Reference [Computer software manual]. [Chrome Developer Tools]. Retrieved 3 September 2018, from <https://developers.google.com/web/tools/chrome-devtools/network-performance/reference>
- Baudot, F., Delcroix, G., Le Grand, G., Petitcolas, S., Jagdish, P., Castelluccia, C., Lefruit, J., & Roca, V. (2012). *Mobilitics*. [Presentation]. Paris: CNIL. Retrieved 4 January 2016, from http://www.cnil.fr/fileadmin/documents/La_CNIL/publications/DEIP/Mobilitics_confPresse_09042013.pdf
- Bavelas, A. (1948). A mathematical model for group structures. *Applied anthropology*, 7(3), 16–30.
- Beeswax (2017). *Beeswax API*. [Release notes]. Retrieved 29 January 2018, from <https://docs.beeswax.com/docs/release-notes>
- Belshe, M., Peon, R., & Thomson, M. (2015, May). *Hypertext Transfer Protocol Version 2 (HTTP/2)*. Retrieved from <http://tools.ietf.org/rfc/rfc7540.txt> (RFC7540)

- Benatallah, B., Casati, F., & Toumani, F. (2004). Web service conversation modeling: A cornerstone for e-business automation. *Internet Computing, IEEE*, 8(1), 46-54. doi: <http://dx.doi.org/10.1109/MIC.2004.1260703>
- Benson, A. R., Gleich, D. F., & Leskovec, J. (2016). Higher-order organization of complex networks. *Science*, 353(6295), 163-166.
- Berners-Lee, T. (2017). *Three challenges for the web, according to its inventor*. [Blogpost]. Retrieved 26 January 2018, from <https://webfoundation.org/2017/03/web-turns-28-letter/>
- Berners-Lee, T., Fielding, R., & Frystyk, H. (1996, May). *Hypertext Transfer Protocol – HTTP/1.0*. Retrieved from <http://tools.ietf.org/rfc/rfc1945.txt> (RFC1945)
- Berners-Lee, T., Fielding, R., & Masinter, L. (2005, January). *Uniform Resource Identifier (URI): Generic Syntax*. Retrieved from <http://tools.ietf.org/rfc/rfc3986.txt> (RFC3986)
- Beyer, M., & Douglas, L. (2012). The Importance of 'Big Data': A Definition. In *Gartner report (ID Number: G00235055)*. Stamford, CT: Gartner, Inc. Retrieved 26 March 2014, from <https://www.gartner.com/it-glossary/big-data/>
- Bidelman, E. (2017). *Getting Started with Headless Chrome*. [Blogpost]. Google. Retrieved 28 January 2018, from <https://developers.google.com/web/updates/2017/04/headless-chrome>
- BidSwitch (2016). *The Integration Challenge*. [Blogpost]. IPONWEB. Retrieved 8 August 2016, from <http://www.bidswitch.com/what-is-it/>
- Blok, P. (2018, February 7). *Inleiding gegevensbescherming*. [Slides]. Utrecht: Universiteit Utrecht.
- Blondel, V. D., Guillaume, J., Lambiotte, R., & Lefebvre, E. (2008). Fast unfolding of communities in large networks. *Journal of statistical mechanics: theory and experiment*, 2008(10), P10008.
- Boda, K., Földes, Á., Gulyás, G., & Imre, S. (2011). User tracking on the web via cross-browser fingerprinting. In *Nordic Conference on Secure IT Systems* (pp. 31-46).
- Boerman, S., Kruikemeier, S., & Zuiderveen Borgesius, F. (2017). Online behavioral advertising: A literature review and research agenda. *Journal of Advertising*, 46(3), 363-376.
- Bojinov, H., Michalevsky, Y., Nakibly, G., & Boneh, D. (2014). Mobile device identification via sensor fingerprinting. *arXiv preprint arXiv:1408.1416*.

- Bonacich, P. (1987). Power and centrality: A family of measures. *American journal of sociology*, 92(5), 1170–1182.
- Boogert, E. (2011). *Browsermakers gaan privacy consument beschermen*. Amsterdam: Emerce.nl. Retrieved 10 January 2014, from <http://www.emerce.nl/nieuws/browsermakers-gaan-privacy-consument-beschermen>
- Brandes, U. (2001). A faster algorithm for betweenness centrality. *Journal of mathematical sociology*, 25(2), 163–177.
- Bray, T. (2014, March). *The JavaScript Object Notation (JSON) Data Interchange Format*. Retrieved from <http://tools.ietf.org/rfc/rfc7159.txt> (RFC7159)
- Brinker, S. (2014). *Marketing Technology Landscape Super-graphic*. [Blogpost]. Chiefmartec.com. Retrieved 2 January 2015, from <http://chiefmartec.com/2014/01/marketing-technology-landscape-supergraphic-2014/>
- Brock, J. (2012). *TrackerBlock*. [Browser extension]. PrivacyChoice.org. Retrieved 21 June 2015, from <https://addons.mozilla.org/nl/firefox/addon/trackerblock/?src=userprofile>
- Brookman, J. (2015). *What is cross-device tracking*. [Presentation]. Washington, DC: Federal Trade Commission. Retrieved 29 December 2015, from https://www.ftc.gov/system/files/documents/public_events/630761/cross-device_tracking_workshop_deck.pptx
- Brookman, J., Rouge, P., Alva, A., & Yeung, C. (2017). Cross-device tracking: Measurement and disclosures. *Proceedings on Privacy Enhancing Technologies*, 2017(2), 133–148.
- Budak, C., Goel, S., Rao, J., & Zervas, G. (2014). Do-Not-Track and the Economics of Third-Party Advertising. *Boston U. School of Management Research Paper*(2505643).
- Bujlow, T., Carela-Español, V., Solé-Pareta, J., & Barlet-Ros, P. (2015). Web Tracking: Mechanisms, Implications, and Defenses. *arXiv preprint arXiv:1507.07872*.
- Bujlow, T., Carela-Español, V., Solé-Pareta, J., & Barlet-Ros, P. (2017). A survey on web tracking: Mechanisms, implications, and defenses. *Proceedings of the IEEE*, 105(8), 1476–1510.
- Burnik, J. (2017, April 14). *Fw: FOI request with regards to the use of Youtube no-cookie solution in Slovenia*. [Personal correspondence].
- Calo, R. (2014). Digital Market Manipulation. *Geo. Wash. L. Rev.*, 82, 995–1304.

- Cao, Y., Li, S., & Wijmans, E. (2017). browser fingerprinting via OS and hardware level features. In *Proceedings of Network & Distributed System Security Symposium (NDSS)*.
- Causata (2010). *The challange of identity association*. [Whitepaper]. Causata. Retrieved 29 September 2015, from https://web.archive.org/web/20110908003213/http://www.causata.com/res/pdf/Causata_Identity_Association.pdf
- Chaabane, A., Ding, Y., Dey, R., Kaafar, M., & Ross, K. (2014). A Closer Look at Third-Party OSN Applications: Are They Leaking Your Personal Information? In *International Conference on Passive and Active Network Measurement* (pp. 235–246).
- Chen, B., Yuan, S., & Wang, J. (2014). A dynamic pricing model for unifying programmatic guarantee and real-time bidding in display advertising. In *Proceedings of the Eighth International Workshop on Data Mining for Online Advertising* (pp. 1–9).
- Chen, Y. (2017). *Programmatic advertising is preparing for the first-price auction era*. [Blogpost]. Retrieved 8 July 2018, from <https://digiday.com/marketing/programmatic-advertising-readying-first-price-auction-era/>
- Chester, J. (2018, January 24). *Fwd: Xaxis Lightning Bolt Tag - Frequently Asked Questions*. [Personal correspondence].
- Chester, J., & Montgomery, K. (2017). The role of digital marketing in political campaigns. In *Internet policy review, Journal on internal regulation* (Vol. 6, p. 20). Berlin, Germany: Alexander von Humboldt Institute for internet and society. doi: 10.14763/2017.4.773
- Christl, W., & Spiekermann, S. (2016). *Networks of control: a report on corporate surveillance, digital tracking, big data & privacy*. Wien: Facultas.
- Citro, C. (2014). *Bigquery*. [Github]. Retrieved 28 June 2015, from <https://github.com/hadley/bigquery>
- Clark, N. (2015). Internet Governance: Is it finally time to drop the training wheels? In *Australian Journal of Telecommunications and the Digital Economy* (Vol. 3). doi: <http://doi.org/10.18080/ajtde.v3n1.3>
- Claypotch, M. (2017). *Using Headless Mode in Firefox*. [Blogpost]. Mozilla Hacks Blog. Retrieved 28 January 2018, from <https://hacks.mozilla.org/2017/12/using-headless-mode-in-firefox>

- Clift, F. (2014). *Chrome remote shell*. [Github]. Retrieved 23 June 2015, from https://github.com/minektur/chrome_remote_shell
- CM Summit, & BattelleMedia (2013). *Behind the banner. A visualization of the adtech ecosystem*. [WebGL visualization]. Retrieved 28 December 2013, from <http://cmsummit.com/behindthebanner/>
- Cofone, I. (2015). *Privacy tradeoffs in information technology law* (Unpublished doctoral dissertation). Erasmus Universiteit Rotterdam.
- Cofone, I. (2017). The way the cookie crumbles: online tracking meets behavioural economics . *International Journal of Law and Information Technology*, 25(1), 38–62.
- Cohn, B. S., & Marriott, M. (1958). Networks and centres of integration in indian civilization. *Journal of social Research*, 1(1), 1–9.
- Cooper, A., Tschofenig, H., Aboba, B., Peterson, J., Morris, J., Hansen, M., & Smith, R. (2013, July). *Privacy Considerations for Internet Protocols*. Retrieved from <http://tools.ietf.org/rfc/rfc6973.txt> (RFC6973)
- Cortesi, A. (2011). *Netograph*. Retrieved 5 August 2016, from <http://www.netograph.com>
- Cortesi, A. (2017). *Netograph*. Retrieved 18 September 2017, from <https://netograph.io/docs/api/overview>
- Cortesi, A., Hils, M., Kriechbaumer, T., & contributors. (2010). *Mitmproxy: A free and open source interactive HTTPS proxy*. Retrieved from <https://mitmproxy.org/> ([Version 4.0])
- Cortesi, A., Shaver, J., & Wingert, J. (2014). *har_extractor.py*. [Github]. Retrieved 19 June 2015, from https://github.com/mitmproxy/mitmproxy/blob/master/examples/har_extractor.py
- Council of Europe (1980). *Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data*.
- Council of Europe (2010). *The protection of individuals with regard to automatic processing of personal data in the context of profiling. Recommendation CM/Rec(2010)13 and explanatory memorandum*. Retrieved 25 July 2016, from [https://www.coe.int/t/dghl/standardsetting/cdcj/CDCJ%20Recommendations/CMRec\(2010\)13E_Profiling.pdf](https://www.coe.int/t/dghl/standardsetting/cdcj/CDCJ%20Recommendations/CMRec(2010)13E_Profiling.pdf)

- Council of Europe (2018). *Protocol (CETS No. 223) amending the Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data (ETS No. 108)*.
- Crocker, D., & Overell, P. (2008, January). *Augmented BNF for Syntax Specifications: ABNF*. Retrieved from <http://tools.ietf.org/rfc/rfc5234.txt> (RFC5234)
- Crunchbase (2007). *The Rubicon Project*. [Web service]. Retrieved 3 September 2018, from <https://www.crunchbase.com/organization/rubiconproject>
- Csárdi, G., & Nepusz, T. (2006). The igraph software package for complex network research. *InterJournal, Complex Systems*, 1695. Retrieved from <http://igraph.org>
- Csárdi, G., & Nepusz, T. (2014). *iGraph R Package [Computer software manual]*. Vienna, Austria. Retrieved 16 June 2015, from <http://igraph.org/r/#rmanual>
- Daigle, L. (2004, September). *WHOIS Protocol Specification*. Retrieved from <http://tools.ietf.org/rfc/rfc3912.txt> (RFC3912)
- Das, A., Acar, G., Borisov, N., & Pradeep, A. (2018). The Web's Sixth Sense: A Study of Scripts Accessing Smartphone Sensors.
- Das, A., Borisov, N., & Caesar, M. (2016). Tracking Mobile Web Users Through Motion Sensors: Attacks and Defenses. In *NDSS*.
- Das, A., Borisov, N., & Chou, E. (2018). Every Move You Make: Exploring Practical Issues in Smartphone Motion Sensor Fingerprinting and Countermeasures. *Proceedings on Privacy Enhancing Technologies*, 2018(1), 88–108.
- Davis, K. (2012). *Ethics of Big Data: Balancing risk and innovation*. O'Reilly Media, Inc.
- Davis, W. (2013). New Stanford Initiative Helps Browser Developers Refine Cookie-Blocking. In *Mediapost*. New York, NY: Mediapost. Retrieved 8 August 2013, from <http://www.mediapost.com/publications/article/202869/cookie-clearinghouse-project-could-block-third-par.html>
- Degeling, M., & Nierhoff, J. (2018). Tracking and Tricking a Profiler. In *Workshop on Privacy in the Electronic Society (WPES) 2018*.
- Degeling, M., Utz, C., Lentzsch, C., Hosseini, H., Schaub, F., & Holz, T. (2018). We Value Your Privacy... Now Take Some Cookies: Measuring the GDPR's Impact on Web Privacy. *arXiv preprint arXiv:1808.05096*.

- Dey, S., Roy, N., Xu, W., Choudhury, R., & Nelakuditi, S. (2014). AccelPrint: Imperfections of Accelerometers Make Smartphones Trackable. In *NDSS*.
- DLA Piper (2016). *EU law on cookies*. [Table]. Retrieved 6 July 2018, from https://www.dlapiper.com/~media/Files/Other/EU_Cookies_Update.pdf
- Doty, N. (2015). *Fingerprinting Guidance for Web Specification Authors*. [Unofficial Draft 13 November 2015]. World Wide Web Consortium (W3C). Retrieved 30 December 2015, from <https://w3c.github.io/fingerprinting-guidance/>
- Doty, N. (2017). *Fingerprinting Guidance for Web Specification Authors*. [W3C Editor's Draft 11 May 2017]. World Wide Web Consortium (W3C). Retrieved 8 August 2016, from <https://w3c.github.io/fingerprinting-guidance/>
- Doty, N., & Mulligan, D. (2013). Internet Multistakeholder Processes and Techno-Policy Standards: Initial Reflections on Privacy at the World Wide Web Consortium. *J. on Telecomm. & High Tech. L.*, 11, 135.
- Doty, N., West, H., Brookman, J., Harvey, S., & Newland, E. (2016). *Tracking Compliance and Scope (DNT)*. W3C Candidate Recommendation 26 April 2016. Retrieved 4 September 2017, from <http://www.w3.org/2011/tracking-protection/drafts/tracking-compliance.html>
- Dubbeld, L. (2004). *The regulation of the observing gaze: privacy implications of camera surveillance*. Twente University.
- Duggan, B. (2014, April 4). *Programmatic Buying: Efficiency, Effectiveness But also Lack of Knowledge & Transparency*. [Blogpost]. Retrieved 6 April 2014, from <https://www.ana.net/blogs/show/id/30025>
- Dumortier, J., & Kosta, E. (2015). *ePrivacy Directive: assessment of transposition, effectiveness and compatibility with proposed Data Protection Regulation*. [SMART 2013/007116].
- Dunn, R., Dudbridge, F., & Sanderson, C. (2005). The use of edge-betweenness clustering to investigate biological function in protein interaction networks. *BMC bioinformatics*, 6(1), 39.
- Eckersley, P. (2010a). How unique is your web browser? In *Privacy Enhancing Technologies* (pp. 1–18). Springer.
- Eckersley, P. (2010b). *A primer on information theory and privacy*. [Blogpost]. Electronic Frontier Foundation (EFF). Retrieved 1 July 2015, from <https://www.eff.org/deeplinks/2010/01/primer-information-theory-and-privacy>

- Eckersley, P. (2015, July 30). *Re: remark on DNT default + 2 questions on code*. [Personal correspondence].
- Eckersley, P., et al. (2014). *Privacy Badger: How heuristic blocking works*. [Github]. Electronic Frontier Foundation (EFF). Retrieved 30 June 2015, from <https://github.com/EFForg/privacybadgerfirefox>
- EFF (2015). *Do Not Track Compliance Policy. Discussion version [0.2 in progress]*. [Github]. Electronic Frontier Foundation (EFF). Retrieved 30 June 2015, from <https://github.com/EFForg/dnt-policy>
- Efrem, E., Svensson, J., & Neubauer, P. (2000). Neo4j open source code [Computer software manual]. [Github]. San Mateo. Retrieved 31 March June 2018, from <https://github.com/neo4j/neo4j>
- Eich, B., Bondy, B., et al. (2016). *Brave*. [Github]. San Francisco, CA: Brave Software Inc. Retrieved 4 July 2016, from <https://github.com/brave/browse-laptop>
- Ellis, B. (2014). *Real-time Analytics: Techniques to Analyze and Visualize Streaming Data*. Indianapolis, IN: John Wiley & Sons.
- Englehardt, S. (2016). *OpenWPM Crawl 100k Alexa web-sites, statefull dataset*. [Dropbox]. Retrieved 7 January 2017, from https://www.dropbox.com/s/85ul7lsyc89gdmv/2016-01_100k_stateful.tar.bz2
- Englehardt, S. (2018). *Automated discovery of privacy violations on the web*. PhD thesis. Tilburg: Princeton University.
- Englehardt, S., Acar, G., & Narayanan, A. (2017). *No boundaries: Exfiltration of personal data by session-replay scripts*. [Blogpost]. Retrieved 26 November 2017, from <https://freedom-to-tinker.com/2017/11/15/no-boundaries-exfiltration-of-personal-data-by-session-replay-scripts/>
- Englehardt, S., Eubank, C., Zimmerman, P., Reisman, D., & Narayanan, A. (2014). *Web Privacy Measurement: Scientific principles, engineering platform, and new results*. [Draft, Jun 1, 2014]. Princeton, NJ: Center for Information Technology Policy. Retrieved 17 May 2015, from <http://randomwalker.info/publications/WebPrivacyMeasurement.pdf>
- Englehardt, S., Han, J., & Narayanan, A. (2018). I never signed up for this! Privacy implications of email tracking. *Proceedings on Privacy Enhancing Technologies*, 2018(1), 109–126.
- Englehardt, S., & Narayanan, A. (2016). Online Tracking: A 1-million-site Measurement and Analysis. In *Proceedings of the*

- 2016 ACM SIGSAC Conference on Computer and Communications Security (pp. 1388–1401). New York, NY, USA: ACM. Retrieved from <http://doi.acm.org/10.1145/2976749.2978313> doi: 10.1145/2976749.2978313
- Englehardt, S., Reisman, D., Eubank, C., Zimmerman, P., Mayer, J., Narayanan, A., & Felten, E. (2015). Cookies That Give You Away: The Surveillance Implications of Web Tracking. In *Proceedings of the 24th International Conference on World Wide Web* (pp. 289–299).
- Ermakova, T., Fabian, B., Bender, B., & Klimek, K. (2018). Web Tracking-A Literature Review on the State of Research. In *Proceedings of the 51st Hawaii International Conference on System Sciences*.
- Eubank, C., Melara, M., Perez-Botero, D., & Narayanan, A. (2013). Shining the floodlights on mobile web tracking-a privacy survey. In *Proceedings of the IEEE Workshop on Web* (Vol. 2).
- European Commission (2017, January 17). *Proposal for a regulation of the European Parliament and of the Council concerning the respect for private life and the protection of personal data in electronic communications and repealing Directive 2002/58/EC (Regulation on Privacy and Electronic Communications)*. COM(2017) 10 final: 2017/0003 (COD).
- European Journalism Centre (2009). *EUfeeds, over 1,000 newspapers, updated every 20 minutes*. [Webservice]. Retrieved 3 December 2017, from <http://www.eufeds.eu/>
- Evans, C., Palmer, C., & Sleevi, R. (2015, April). *Public Key Pinning Extension for HTTP*. Retrieved from <http://tools.ietf.org/rfc/rfc7469.txt> (RFC7469)
- Evidon (2013). *Trackermap*. Retrieved 5 August 2016, from <https://www.ghostery.com/why-ghostery/trackermap/>
- Fairchild, J. (2018). *Google exchange bidding and OpenX case study: delivering increased demand and value for publishers globally*. Pasadena, CA: OpenX Technologies.
- Falissard, B. (2009). *Psy R-package version 1.0 [Computer software manual]*.
- Farrell, S., & Tschofenig, H. (2014, May). *Pervasive Monitoring Is an Attack*. Retrieved from <http://tools.ietf.org/rfc/rfc7258.txt> (RFC7258)
- Farrell, S., Wenning, R., Bos, B., Blanchet, M., & Tschofenig, H. (2015, December). *Report from the Strengthening the Internet*

- (*STRINT*) Workshop. Retrieved from <http://tools.ietf.org/rfc/rfc7687.txt> (RFC7687)
- Fed, J. (2018). *Respect Do Not Track parameter with Google Tag Manager*. [Blogpost]. Retrieved 16 July 2018, from <https://www.analyticsmania.com/post/respect-do-not-track-parameter-google-tag-manager>
- Feng, Y., Vasconcellos Vargas, D., Sakurai, K., Yu, S., & Ishikawa, T. (2017). Privacy Leakage of Job-related Information Seeking in Online Social Networks. *Information Processing Society of Japan SIG Technical Report*.
- Fieldfisher (2014). *Cookie 'consent' rule: EEA implementation*. [Table]. Retrieved 6 July 2018, from <https://www.fieldfisher.com/media/2481995/eu-cookie-consent-tracking-table.pdf>
- Fielding, R. (2015, May 27). *Re: question on HTTP header fields*. [Personal correspondence].
- Fielding, R., Gettys, J., Mogul, J., Frystyk, H., & Berners-Lee, T. (1997, January). *Hypertext Transfer Protocol – HTTP/1.1*. Retrieved from <http://tools.ietf.org/rfc/rfc2068.txt> (RFC2068)
- Fielding, R., Nottingham, M., & Reschke, J. (2014, June). *Hypertext Transfer Protocol (HTTP/1.1): Caching*. Retrieved from <http://tools.ietf.org/rfc/rfc7234.txt> (RFC7234)
- Fielding, R., & Reschke, J. (2014a, June). *Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing*. Retrieved from <http://tools.ietf.org/rfc/rfc7230.txt> (RFC7230)
- Fielding, R., & Reschke, J. (2014b, June). *Hypertext Transfer Protocol (HTTP/1.1): Semantics and Content*. Retrieved from <http://tools.ietf.org/rfc/rfc7231.txt> (RFC7231)
- Fielding, R., & Singer, D. (2018). *Tracking Preference Expression (DNT)*. W3C Working Group Note 20 October 2018. Retrieved 7 December 2018, from <https://w3c.github.io/dnt/drafts/tracking-dnt.html>
- Freeman, L. (1977). A set of measures of centrality based on betweenness. *Sociometry*, 35–41.
- FTC (2007). *FTC Staff Proposes Online Behavioral Advertising Privacy Principles*. FTC Staff Report. Washington, DC: Federal Trade Commission.
- FTC (2009). *FTC Staff Revises Online Behavioral Advertising Principles*. FTC Staff Report. Washington, DC: Federal Trade Commission.

- FTC (2010). *Protecting Consumers Privacy in an Era of Rapid Change*. Preliminary FTC Staff Report. Washington, DC: Federal Trade Commission.
- FTC (2013). *Speech A Rose By Any Other Name . . . Would Probably Violate the FTC Act: Shakespeare, the FTC, and Advertising*. Remarks of FTC Chairwoman Edith Ramirez Before the American Advertising Federation. Washington, DC: Federal Trade Commission.
- Funkhouser, K., Malloy, M., Alp, E., Poon, P., & Barford, P. (2018). Device Graphing by Example. In *Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*.
- Galili, Tal, O'Callaghan, Alan, Sidi, Jonathan, Sievert, & Carson. (2017). heatmaply: an R package for creating interactive cluster heatmaps for online publishing. *Bioinformatics*. doi: 10.1093/bioinformatics/btx657
- Gallagher, R., & Greenwald, G. (2014). *How the NSA Plans to Infect "Millions" of Computers with Malware*. London: The Guardian.
- Gastineau, P. (2015). *HTTP Methods*. [Blogpost]. WhiteHat Security. Retrieved 25 July 2016, from <https://www.whitehatsec.com/blog/http-methods/>
- Geer, D. (2015). *T.S. Kuhn Revisited: Does a field make progress because it is a science, or is it a science because it makes progress?* Retrieved 8 April 2018, from <http://geer.tinho.net/geer.nsf.6i15.txt>
- Gomez, J., Pinnick, T., & Soltani, A. (2009). *KnowPrivacy*. Berkeley, CA: UC Berkeley. Retrieved 3 April 2018, from http://www.knowprivacy.org/report/KnowPrivacy_Final_Report.pdf
- Gómez-Boix, A., Laperdrix, P., & Baudry, B. (2018). Hiding in the Crowd: an Analysis of the Effectiveness of Browser Fingerprinting at Large Scale. In *WWW 2018: The 2018 Web Conference*.
- Google (n.d.-a). *Cloud Bigtable*. Retrieved 23 August 2018, from <https://cloud.google.com/bigtable/>
- Google (n.d.-b). *Developer Console Help: Advertising ID*. [FAQ]. Retrieved 2 January 2016, from <https://support.google.com/googleplay/android-developer/answer/6048248?hl=en>
- Google (n.d.-c). *How Floodlight counts conversions*. [Report]. Retrieved 26 January 2018, from <https://support.google.com/ds/answer/7305597?hl=en>
- Google (2015). *Chrome debugging protocol: Debugger protocol version 1.1* [Computer software manual]. [Chrome Devel-

- oper Tools]. Retrieved 23 June 2015, from <https://developer.chrome.com/devtools/docs/debugger-protocol>
- Google (2016a). *Ad Exchange Overview: Demand-Side Platforms*. [Video]. DoubleClick Publisher Training. Retrieved 19 February 2019, from <https://www.youtube.com/watch?v=MR9Zg1Cw8A0>
- Google (2016b). *Bidding API*. [Documentation]. Retrieved 29 January 2018, from <https://developers.google.com/ad-exchange/rtb/open-bidder/bidding-apis>
- Google (2017a). *Data Layer Helper Library*. [Github]. Google. Retrieved 18 February 2018, from <https://github.com/google/data-layer-helper>
- Google (2017b). *Google Tag Manager, web tracking developer guide: Using a Data Layer*. [Developer Guide]. Google. Retrieved 18 February 2018, from <https://developers.google.com/tag-manager/devguide>
- Google (2017c). *KLM activates data in real-time using Relay42's DMP and the Google platform*. [Blogpost]. Retrieved 21 January 2018, from <https://www.thinkwithgoogle.com/intl/en-154/insights-inspiration/case-studies/klm-activates-data-real-time-using-relay42s-dmp-and-google-platform>
- Gratton, E. (2013). *Understanding personal information: managing privacy risks*. Markham, Ont.: LexisNexis.
- Greco, A., & Shumpert, R. (2011). Real-time customer intelligence with Paul Phillips. In *Beyond Web Analytics Podcast, Episode 45*. Beyond Web Analytics! [Podcast]. Retrieved 12 January 2015, from <http://www.beyondwebanalytics.com/2011/05/07/episode-45/>
- Greenwald, G. (2013). *NSA collecting phone records of millions of Verizon customers daily*. London: the Guardian. Retrieved 8 March 2014, from <http://www.theguardian.com/world/2013/jun/06/nsa-phone-records-verizon-court-order>
- Grigas, P., Lobos, A., Wen, Z., & Lee, K. (2017). *Profit Maximization for Online Advertising Demand-Side Platforms*. [Presentation]. Halifax: KDD 2017. Retrieved 8 April 2018, from <https://drive.google.com/file/d/0BwF-hgLdpCD6ZFp4eGx0Wkt2Z1E/view>
- Grigorik, I. (2013). *HTTP Archive + BigQuery = Web Performance Answers*. [Google BigQuery]. Retrieved 28 June 2015, from <https://bigquery.cloud.google.com>
- Grigorik, I. (2015). *Preload*. W3C Editor's Draft 11 June 2015. Retrieved 19 June 2015, from <http://w3c.github.io/preload/>

- Grimmelmann, J. (2012). *The Sabotage of Do Not Track*. [Blogpost]. Retrieved 19 November 2017, from http://laboratorium.net/archive/2012/06/19/the_sabotage_of_do_not_track
- Gulyas, G. G., Some, D. F., Bielova, N., & Castelluccia, C. (2018). To Extend or not to Extend: on the Uniqueness of Browser Extensions and Web Logins. *arXiv preprint arXiv:1808.07359*.
- Gürses, S. (2010). *Multilateral privacy requirements analysis in online social network services*. PhD thesis. Heverlee: KU Leuven.
- Guye, M., Bettus, G., Bartolomei, F., & Cozzone, P. (2010). Graph theoretical analysis of structural and functional connectivity MRI in normal and pathological brain networks. *Magnetic Resonance Materials in Physics, Biology and Medicine*, 23(5-6), 409–421.
- Haga, Y., Takata, Y., Akiyama, M., & Mori, T. (2017). Building a Scalable Web Tracking Detection System: Implementation and the Empirical Study. *IEICE TRANSACTIONS on Information and Systems*, 100(8), 1663–1670.
- Hannak, A., Sapiezynski, P., Molavi Kakhki, A., Krishnamurthy, B., Lazer, D., Mislove, A., & Wilson, C. (2013). Measuring personalization of Web search. In *Proceedings of the 22nd international conference on World Wide Web* (pp. 527–538).
- Harris, D. (2013, March 4). *The history of Hadoop: From 4 nodes to the future of data*. [Interview]. Retrieved 12 April 2014, from <http://gigaom.com/2013/03/04/the-history-of-hadoop-from-4-nodes-to-the-future-of-data/>
- Hauschke, C. (2016). Third-Party-Elemente in deutschen Bibliothekswebseiten. *Informationspraxis*, 2(2).
- Hearne, S. (2008). *Request Map Generator*. [Github]. Retrieved 29 August 2018, from <https://github.com/WP0-Foundation/webpagetest>
- Hearne, S. (2013). *Request Map Generator*. [Github]. Retrieved 29 August 2018, from <http://requestmap.webperf.tools/>
- Hearne, S. (2015). *How to Find the Third-Parties on Your Site*. [Github]. Retrieved 29 August 2018, from <https://webperf.ninja/2015/find-third-party-assets/>
- Herz, T., Hamel, F., Uebernickel, F., & Brenner, W. (2010). Deriving a research agenda for the management of multisourcing relationships based on a literature review..
- Hevner, A. R., March, S. T., Park, J., & Ram, S. (2008). Design science in information systems research. *Management Information Systems Quarterly*, 28(1), 6.

- Hickson, I., Berjon, R., Faulkner, S., Leithead, T., Doyle Navara, E., O'Connor, E., & Pfeiffer, S. (2014, October). *HTML5*. 28 October 2014. W3C Recommendation. Retrieved from <http://www.w3.org/TR/html5/> (HTML5)
- Hidayat, A. (2011). *PhantomJS*. [Github]. Retrieved 23 June 2015, from <https://github.com/ariya/phantomjs>
- Hildebrandt, M. (2008). Defining profiling: a new type of knowledge? In *Profiling the European citizen* (pp. 17–45). Springer.
- Hilts, A., & Parsons, C. (2015). *Half Baked: The Opportunity to Secure Cookie-Based Identifiers from Passive Surveillance*. Available at SSRN 2640610.
- Hipp, R. (2000). SQLite [Computer software manual]. Retrieved 12 March 2018, from <https://www.sqlite.org/docs.html>
- Hodges, J., Jackson, C., & Barth, A. (2012, November). *HTTP Strict Transport Security (HSTS)*. Retrieved from <http://tools.ietf.org/rfc/rfc6797.txt> (RFC6797)
- Hoffman-Andrews, J. (2014). *Verizon Injecting Perma-Cookies to Track Mobile Customers, Bypassing Privacy Controls*. [Blog-post]. Retrieved 30 December 2015, from <https://www.eff.org/deeplinks/2014/11/verizon-x-uidh>
- Hoofnagle, C., & Good, N. (2012a). *Methods 2012*. Retrieved 27 December 2015, from <https://www.law.berkeley.edu/centers/bclt/research/privacy-at-bclt/web-privacy-census/methods/>
- Hoofnagle, C., & Good, N. (2012b). *Web Privacy Census October 2012 (Version 2.0), Literature review*. Retrieved 27 December 2015, from <https://www.law.berkeley.edu/centers/bclt/research/privacy-at-bclt/web-privacy-census/literature-review/>
- Hoofnagle, C., & Good, N. (2015). *Methods 2015*. Retrieved 27 December 2015, from <https://www.law.berkeley.edu/centers/bclt/research/privacy-at-bclt/web-privacy-census/methods-2015/>
- IABureau (2012). *Interactive Glossary*. Interactive Advertising Bureau. Retrieved 8 January 2015, from http://www.iab.net/wiki/index.php/Real-time_bidding
- IABureau (2015). *Deal ID*. [Glossary]. Retrieved 29 January 2018, from https://wiki.iab.com/index.php/Deal_ID
- IABureau (2017a). *Header bidding: a byte-sized overview*. Retrieved 1 February 2018, from <https://www.iab.com/wp-content/uploads/2015/10/VidLab-HeaderBidding-3.27.17V10.pdf>

- IABureau (2017b). *OpenRTB 3.0 Framework. Launching Secure Supply Chain Standards. Draft for Public Comment, September 2017*. Retrieved 19 November 2017, from <https://iabtechlab.com/wp-content/uploads/2017/09/OpenRTB-3.0-Draft-Framework-for-Public-Comment.pdf>
- IABureau (2017c). *Programmatic Mobile*. Interactive Advertising Bureau [White paper]. Retrieved 4 September 2017, from <https://www.iabeurope.eu/research-thought-leadership/iab-europe-white-paper-programmatic-mobile/>
- IABureau (2017d). *Standard Header Container Integration with an Ad Server*. [draft, in public review until July 28, 2017]. Retrieved 29 January 2018, from <https://iabtechlab.com/standards/header-tag/>
- IABureau Ad Effectiveness Council (2017). *Ad Effectiveness Glossary of Terms*. Interactive Advertising Bureau. Retrieved 7 September 2017, from <https://www.iabaustralia.com.au/research-and-resources/research-resources/item/12-research-and-resource/2364-digital-advertising-glossaries>
- IABureau Audio Council (2017). *Digital Audio Glossary of Terms*. Interactive Advertising Bureau. Retrieved 7 September 2017, from <https://www.iabaustralia.com.au/research-and-resources/research-resources/item/12-research-and-resource/2364-digital-advertising-glossaries>
- IABureau Mobile Advertising Council (2017). *Mobile Advertising Glossary of Terms*. Interactive Advertising Bureau. Retrieved 7 September 2017, from <https://www.iabaustralia.com.au/research-and-resources/research-resources/item/12-research-and-resource/2364-digital-advertising-glossaries>
- IABureau Video Advertising Council (2017). *Digital Video Glossary of Terms*. Interactive Advertising Bureau. Retrieved 7 September 2017, from <https://www.iabaustralia.com.au/research-and-resources/research-resources/item/12-research-and-resource/2364-digital-advertising-glossaries>
- IANA (2015a). *Message headers*. Internet Assigned Numbers Authority (IANA). Retrieved 17 June 2015, from <http://www.iana.org/assignments/message-headers/message-headers.xhtml> (Last Updated 5 June 2015)
- IANA (2015b). *Protocol Registries*. Internet Assigned Numbers Authority (IANA). Retrieved 17 June 2015, from <https://www>

- .iana.org/protocols
- ICDPPC (2013). *Resolution on Web tracking and Privacy*. Warsaw: International Conference of Data Protection and Privacy Commissioners.
- Improve Digital (2015). *NL Market Map*. [Infograph]. Author. Retrieved 12 December 2015, from http://www.improvedigital.com/main/wp-content/uploads/2015/08/MarketMap_NL_2015.pdf
- Improve Digital (2017a). *2017 Display Advertising Ecosystem Belgium*. [Infograph]. Author. Retrieved 4 September 2017, from http://www.improvedigital.com/main/wp-content/uploads/MarketMap_Belgium.pdf
- Improve Digital (2017b). *2017 Display Advertising Ecosystem France*. [Infograph]. Author. Retrieved 4 September 2017, from http://www.improvedigital.com/main/wp-content/uploads/MarketMap_France.pdf
- Improve Digital (2017c). *2017 Display Advertising Ecosystem Germany*. [Infograph]. Author. Retrieved 4 September 2017, from http://www.improvedigital.com/main/wp-content/uploads/MarketMap_German.pdf
- Improve Digital (2017d). *2017 Display Advertising Ecosystem Italy*. [Infograph]. Author. Retrieved 4 September 2017, from http://www.improvedigital.com/main/wp-content/uploads/MarketMap_Italy.pdf
- Improve Digital (2017e). *2017 Display Advertising Ecosystem Netherlands*. [Infograph]. Author. Retrieved 4 September 2017, from http://www.improvedigital.com/main/wp-content/uploads/MarketMap_Netherlands.pdf
- Improve Digital (2017f). *2017 Display Advertising Ecosystem Nordics*. [Infograph]. Author. Retrieved 4 September 2017, from http://www.improvedigital.com/main/wp-content/uploads/MarketMap_Nordics.pdf
- Improve Digital (2017g). *2017 Display Advertising Ecosystem Spain*. [Infograph]. Author. Retrieved 4 September 2017, from http://www.improvedigital.com/main/wp-content/uploads/MarketMap_Spain.pdf
- Inter-University Consortium for Political and Social Research (n.d.). *Data*. Retrieved 27 November 2018, from <https://www.icpsr.umich.edu/icpsrweb/ICPSR/support/glossary>
- Internet Privacy Workshop*. (2010, December 8-9). [Workshop report]. Boston, MA: Internet Architecture Board (IAB),

- W3C, ISOC, and MIT CSAIL. Retrieved 11 April 2014, from http://www.iab.org/wp-content/IAB-uploads/2011/03/PrivacyWorkshop_MeetingMinutes.pdf
- Iordanou, C., Smaragdakis, G., Poese, I., & Laoutaris, N. (2018). Tracing Cross Border Web Tracking. In *Proceedings of the ACM Internet Measurement Conference 2018*.
- ISO (2011). *ISO 24760-1:2011 A framework for identity management, Part 1: Terminology and concepts*. Retrieved 13 November 2017, from <https://www.iso.org/standard/57914.html>
- ISO (2013). *ISO 639-1:2002 Codes for the representation of names of languages. Part 1: Alpha-2 code*. Retrieved 1 Juny 2015, from http://www.iso.org/iso/catalogue_detail?csnumber=22109
- Ivie, G., Gunzerath, D., & Pinelli, R. (2015, July 8). *Update on Desktop Viewable Impression Reconciliation Guidance and Reconciliation Checklist*. [Email]. New York, NY: Media Rating Council, Inc.
- IWGDPT (2013). *Working Paper on Web Tracking and Privacy: Respect for context, transparency and control remain essential*. Berlin: Berliner Beauftragter für Datenschutz und Informationsfreiheit. (First official draft by R. van Eijk)
- IWGDPT (2014). *Working Paper on Web Tracking and Privacy: Respect for context, transparency and control remain essential*. In Dr. Alexander Dix (Ed.), *International Documents on Data Protection in Telecommunications and Media* (Vols. 1983–2013, pp. 492–514). Berlin: Berliner Beauftragter für Datenschutz und Informationsfreiheit. (Working paper adopted in 2013. First official draft by Van Eijk, R.)
- Jacobs, A. (2009). The pathologies of big data. *Communications of the ACM*, 52(8), 36–44. doi: <http://dx.doi.org/10.1145/1536616.1536632>
- Janc, A., & Zalewski, M. (2014). *Technical analysis of client identification mechanisms*. [The Chromium Projects, wiki page]. Retrieved 10 June 2015, from <https://www.chromium.org/Home/chromium-security/client-identification-mechanisms>
- Jaquith, M., Firas, Error, & Skeltoac. (2014). *Bad Behavior*, version 2.2.16. [Computer software manual]. Retrieved 6 July 2015, from <http://bad-behavior.ioerror.us/about/>
- Jauvion, G., Grislain, N., Dkengne, P., Garivier, A., & Gerchinovitz, S. (2018, July). Optimization of a SSP's Header Bidding Strategy using Thompson Sampling. *arXiv:1807.03299 [cs, stat]*.

- Retrieved 2018-07-14, from <http://arxiv.org/abs/1807.03299> (arXiv: 1807.03299) doi: 10.1145/3219819.3219917
- Jayaram, M., Kutterer, C., Kwasny, S., Runnegar, C., Seltzer, W., Van Eijk, R., & Zorbas, K. (2012, November 6-9). Who is following me: tracking the trackers. In *Internet Governance Forum*. Baku, Azerbaijan. [Video]. Retrieved 17 May 2015, from https://www.youtube.com/watch?v=mtPqt906u_g
- Kahle, B. (1996). *HTTP Archive*. [Github]. The Internet Archive. Retrieved 28 June 2015, from <https://github.com/HTTPArchive>
- Kamara, I., & Kosta, E. (2016). Do Not Track initiatives: regaining the lost user control. *International Data Privacy Law*, 6(4), 276–290.
- Kamphuis, B. (2013a, July 8). Handel in een fractie van een seconde. In *NOS Eight O’Clock National Evening News*. Hilversum: NOS. [Video]. Retrieved 17 May 2015, from <http://nos.nl/video/527311-handel-in-een-fractie-van-een-seconde.html>
- Kamphuis, B. (2013b). *In Hoe is real time bidding gegroeid?* Hilversum: NOS. [Video]. Retrieved 25 September 2013, from <http://nos.nl/video/527121-hoe-is-real-time-bidding-gegroeid.html>
- Kaye, D. (2015). *Report of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression*, David Kaye. A /HRC/29/32. New York, NY: United Nations.
- Kennish, B., Chau, A., & Oppenheim, C. (2013). *Disconnect*. [Github]. Disconnect. Retrieved 4 July 2016, from <https://github.com/disconnectme/disconnect>
- Klitou, D. (2012). *Privacy-invading technologies: safeguarding privacy, liberty & security in the 21st century* (Unpublished doctoral dissertation). Centre for Law in the Information Society, Faculty of Law, Leiden University.
- Klyne, G., Nottingham, M., & Mogul, J. (2004, September). *Registration Procedures for Message Header Fields*. Retrieved from <http://tools.ietf.org/rfc/rfc3864.txt> (RFC3864)
- Kobusińska, A., Pawluczuk, K., & Brzeziński, J. (2018). Big Data fingerprinting information analytics for sustainability. *Future Generation Computer Systems*.
- Konrad, T. (2017). *Ghostery Unveils Most Advanced AI-Powered Privacy Protection Tool on the Market*. [Blogpost]. Cliqz International.

- Retrieved 12 December 2017, from <https://www.ghostery.com/press/ghostery-8-ai-powered-privacy/>
- Koot, M. (2012). *Measuring and predicting anonymity*. PhD thesis. Amsterdam: University of Amsterdam.
- Koot, M., Mandjes, M., Van't Noordende, G., & De Laat, C. (2011). Efficient probabilistic estimation of quasi-identifier uniqueness. In *Proceedings of NWO ICT.Open*. Utrecht: STW Technology Foundation.
- Kosinski, M. (2014). *Measurement and prediction of individual and group differences in the digital environment* (Unpublished doctoral dissertation). Ph. D. dissertation, Dept. Psychol., Cambridge Univ., Cambridge, UK.
- Kosinski, M., Stillwell, D., & Graepel, T. (2013). Private traits and attributes are predictable from digital records of human behavior. *Proceedings of the National Academy of Sciences*, 110(15), 5802–5805.
- Kostiainen, A. (2018). *Ambient Light Sensor*. W3C Candidate Recommendation, 20 March 2018. Retrieved 30 march 2018, from <https://www.w3.org/TR/2018/CR-ambient-light-20180320/>
- Kostiainen, A., & Bhaumik, R. (2018). *Magnetometer*. W3C Candidate Recommendation, 20 March 2018. Retrieved 30 march 2018, from <https://www.w3.org/TR/2018/CR-magnetometer-20180320/>
- Kostiainen, A., & Lamouri, M. (2014). *Battery Status API*. W3C Candidate Recommendation 09 December 2014. Retrieved 30 December 2015, from <http://www.w3.org/TR/battery-status/>
- Kostiainen, A., & Pozdnyakov, M. (2018). *Gyroscope*. W3C Candidate Recommendation, 20 March 2018. Retrieved 30 march 2018, from <https://www.w3.org/TR/2018/CR-gyroscope-20180320/>
- Kostiainen, A., & Shalamov, A. (2018). *Accelerometer*. W3C Candidate Recommendation, 20 March 2018. Retrieved 30 march 2018, from <https://www.w3.org/TR/2018/CR-accelerometer-20180320/>
- Kotler, P., & Armstrong, G. (2012). *Principles of marketing*. Pearson Education. 14th ed.
- Kranch, M., & Bonneau, J. (2015). Upgrading HTTPS in Mid-Air: An Empirical Study of Strict Transport Security and Key Pinning. In *Network and Distributed System Security (NDSS) Symposium*.

- Krishnamurthy, B. (2017, April 25). *Re: Follow up youtube-nocookie*. [Personal correspondence].
- Krishnamurthy, B., Malandrino, D., & Wills, C. (2007). Measuring privacy loss and the impact of privacy protection in web browsing. In *Proceedings of the 3rd symposium on Usable privacy and security* (pp. 52–63).
- Krishnamurthy, B., & Wills, C. (2006). Generating a privacy footprint on the internet. In *Proceedings of the 6th ACM SIGCOMM conference on Internet measurement* (pp. 65–70).
- Krishnamurthy, B., & Wills, C. (2009a). On the leakage of personally identifiable information via online social networks. In *Proceedings of the 2nd ACM workshop on Online social networks* (pp. 7–12).
- Krishnamurthy, B., & Wills, C. (2009b). Privacy diffusion on the web: a longitudinal perspective. In *Proceedings of the 18th international conference on World wide web* (pp. 541–550).
- Krishnamurthy, B., & Wills, C. (2010, March 21–26). *Privacy leakage on the Internet*. [Presentation]. Anaheim, CA: IETF 77.
- Krishnamurthy, B., & Wills, C. (2012). *WPM Privacy Measurement Bibliography follow-up*. Retrieved 27 December 2015, from <http://web.cs.wpi.edu/~cew/share/wpm.pdf>
- Kristol, D., & Montulli, L. (1997, February). *HTTP State Management Mechanism*. Retrieved from <http://tools.ietf.org/rfc/rfc2109.txt> (RFC2109)
- Kristol, D., & Montulli, L. (2000, October). *HTTP State Management Mechanism*. Retrieved from <http://tools.ietf.org/rfc/rfc2965.txt> (RFC2965)
- Kulyk, O., Hilt, A., Gerber, N., & Volkamer, M. (2018). "This Website Uses Cookies": Users' Perceptions and Reactions to the Cookie Disclaimer. Internet Society. Retrieved 2018-07-07, from https://www.ndss-symposium.org/wp-content/uploads/sites/25/2018/06/eurosec2018_12_Kulyk_paper.pdf doi: 10.14722/eurosec.2018.23012
- Kurtz, A., Gascon, H., Becker, T., Rieck, K., & Freiling, F. (2016). Fingerprinting mobile devices using personalized configurations. *Proceedings on Privacy Enhancing Technologies*, 2016(1), 4–19.
- La Rue, F. (2011). *Report of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, Frank La Rue*. A /HRC/23/40. New York, NY: United Nations.

- Lambiotte, R., & Kosinski, M. (2014). Tracking the digital footprints of personality. *Proceedings of the IEEE*, 102(12), 1934–1939.
- Laperdrix, P. (2017). Browser Fingerprinting: Exploring Device Diversity to Augment Authentication and Build Client-Side Countermeasures. , 169.
- Laperdrix, P., Rudametkin, W., & Baudry, B. (2015). Mitigating Browser Fingerprint Tracking: Multi-level Reconfiguration and Diversification. In *Proceedings of the 10th International Symposium on Software Engineering for Adaptive and Self-Managing Systems* (pp. 98–108). Piscataway, NJ, USA: IEEE Press. Retrieved from <http://dl.acm.org/citation.cfm?id=2821357.2821378>
- Laperdrix, P., Rudametkin, W., & Baudry, B. (2016). Beauty and the Beast: Diverting modern web browsers to build unique browser fingerprints. In *37th IEEE Symposium on Security and Privacy (S&P 2016)*. San Jose, CA. (Available at HAL: hal-01285470v2)
- Laszlo, J., & Smith, B. (2015). Mobile Programmatic Playbook. *Interactive Advertising Bureau Report*. Retrieved 24 December 2015, from <http://www.iab.com/wp-content/uploads/2015/05/MobileProgrammaticPlaybook.pdf>
- Latour, B. (2007). Beware, your imagination leaves digital traces. In *Times Higher Literary Supplement*. London: News UK. Retrieved 12 August 2013, from <http://www.bruno-latour.fr/node/245>
- Lavrenovs, A., & Melon, F. (2018). HTTP Security Headers Analysis of Top One Million Websites. In T. Minárik, R. Jakschis, & L. L. (Eds.), *10th International Conference on Cyber Conflict (CyCon X): Maximising Effects*. Tallin: NATO CCD COE Publications.
- Le Hors, A., Le Hégarret, P., Wood, L., Nicol, G., Robie, J., Champion, M., & Byrne, S. (2004). *Document Object Model (DOM) Level 3 Core Specification*. Version 1.0, W3C Recommendation 07 April 2004. Retrieved 22 June 2015, from <http://www.w3.org/TR/DOM-Level-3-Core/> (DOM 3 CORE)
- Leenes, R., & Kosta, E. (2015). Taming the cookie monster with dutch law—a tale of regulatory failure. *Computer Law & Security Review*, 31(3), 317–335.
- Leung, C., Ren, J., Choffnes, D., & Wilson, C. (2016). Should you use the app for that?: Comparing the privacy implications of app-and web-based online services. In *Proceedings of the 2016 Internet Measurement Conference* (pp. 365–372).

- Levin, C., & McCain, J. (2014). *Online advertising and hidden hazards to consumer security and data privacy*. Washington, DC: United States Senate Permanent Subcommittee on Investigations, Committee on Homeland Security and Governmental Affairs.
- Libbenga, J. (2013). *Mozilla wil cookiegedrag inperken*. Amsterdam: Emerce.nl. Retrieved 8 August 2013, from <http://www.emerce.nl/nieuws/mozilla-cookiegedrag-inperken>
- Libbenga, J. (2014). *Machtsstrijd: de wereld na de cookie*. Amsterdam: Emerce.nl. Retrieved 10 Januari 2016, from <http://www.emerce.nl/nieuws/machtsstrijd-wereld-na-cookie>
- Libert, T. (2015a). Exposing the hidden web: An analysis of third-party http requests on 1 million websites. *International Journal of Communication*, 9, 3544–3561.
- Libert, T. (2015b). Privacy implications of health information seeking on the web. *Communications of the ACM*, 58(3), 68–77.
- Libert, T. (2015c). *WebXray*. [Github]. Retrieved 30 December 2015, from <https://github.com/timlib/webXray.git>
- Libert, T. (2018). An Automated Approach to Auditing Disclosure of Third-Party Data Collection in Website Privacy Policies. In *The Web Conference (WWW2018)*.
- Libert, T., & Graves, L. (2018). Third-party web content on EU news sites. Potential challenges and paths to privacy improvement. [Factsheet].
- Libert, T., Graves, L., & Nielsen, R. K. (2018). Changes in third-party content on European news websites after GDPR. [Factsheet].
- Lindskow, K. (2016). *Exploring Digital News Publishing Business Models: A Production Network Approach*. PhD thesis. Copenhagen: Copenhagen Business School.
- Loukides, M. (2010). *What is data science? The future belongs to the companies and people that turn data into products*. Sebastopol, CA: O'Reilly Radar. Retrieved 26 March 2014, from <http://radar.oreilly.com/2010/06/what-is-data-science.html>
- Lumapartners (2014). *Marketing Technology LUMAscape*. [Blogpost]. Lumapartners.com. Retrieved 2 January 2015, from <http://www.lumapartners.com/lumascape/marketing-technology-lumascape/>
- Lynch, C. (2008). Big data: How do your data grow? *Nature*, 455(7209), 28–29.
- Maass, M., Wichmann, P., Pridöhl, H., & Herrmann, D. (2017). PrivacyScore: Improving Privacy and Security via Crowd-Sourced

- Benchmarks of Websites. In *Annual Privacy Forum* (pp. 178–191).
- Majumdar, S., Kulkarni, D., & Ravishankar, C. (2007). Addressing click fraud in content delivery systems. In *INFOCOM 2007. 26th IEEE International Conference on Computer Communications*. IEEE (pp. 240–248).
- Malloy, M., Barford, P., Alp, E., Koller, J., & Jewell, A. (2017). Internet Device Graphs. In *Proceedings of the 23rd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining* (pp. 1913–1921).
- Marquis-Boire, M., Greenwald, G., & Lee, M. (2015). *XKEYSCORE: NSA's Google for the World's Private Communications*. The Intercept. Retrieved 2 July 2015, from <https://firstlook.org/theintercept/2015/07/01/nsas-google-worlds-private-communications/>
- Mayer, J. (2015a). Surveillance Law: A Conversation with Peter Swire, Member of the President's Intelligence Review Group. [Coursera]. Retrieved 27 December 2015, from <https://class.coursera.org/surveillance-001/lecture/95>
- Mayer, J. (2015b). *The Turn-Verizon Zombie Cookie*. [Blogpost]. Retrieved 30 December 2015, from <http://webpolicy.org/2015/01/14/turn-verizon-zombie-cookie/>
- Mayer, J., & Mitchell, J. (2012). Third-party Web tracking: Policy and technology. In *Security and Privacy (SP), 2012 IEEE Symposium on* (pp. 413–427). Washington, DC: IEEE.
- Mayer, J., Narayanan, A., & Stamm, S. (2011, September). *Do Not Track: A Universal Third-Party Web Tracking Opt Out*. draft-mayer-do-not-track-00. IETF. Retrieved 11 April 2014, from <http://tools.ietf.org/id/draft-mayer-do-not-track-00.txt>
- Mayer-Schönberger, V., & Cukier, K. (2013). *Big data: A revolution that will transform how we live, work, and think*. Boston: Houghton Mifflin Harcourt.
- Mazel, J., Garnier, R., & Fukuda, K. (2017). A comparison of web privacy protection techniques. *arXiv preprint arXiv:1712.06850*.
- McDonald, A. (2018). Stakeholders and High Stakes Divergent Standards for Do Not Track. In J. Polonetsky, O. Tene, & E. Selinger (Eds.), *Cambridge Handbook of Consumer Privacy*. Cambridge: Cambridge University Press.

- McDonald, A., & Van Eijk, R. (2012, May 31-June 1). Problem identification. In *Workshop Web Privacy Measurement*. Berkeley, CA: Berkeley Center for Law & Technology.
- Media Impact (2018). *Integration von Google (DfP/AdX) in einen AppNexus AdStack*. [Whitepaper]. Media Impact. Retrieved 27 May 2018, from https://omr.mediaimpact.de/assets/img/Whitepaper_Media-Impact_AdStack.pdf
- Meesters, P. (2014). *Intelligent Blauw, Intelligence-gestuurde politiezorg in gebiedsgebonden eenheden*. PhD thesis. Tilburg: Tilburg University.
- Melnik, S., Gubarev, A., Long, J., Romer, G., Shivakumar, S., Tolton, M., & Vassilakis, T. (2010). Dremel: Interactive Analysis of Web-Scale Datasets. In *Proc. of the 36th Very Large Data Bases (VLDB) Conference* (p. 330-339). VLDB Endowment Inc.
- Meron, S., & Huh, J. (2014). *Yahoo to Acquire BrightRoll. Creates the largest digital video advertising platform*. [Blogpost]. Retrieved 9 April 2018, from <https://www.businesswire.com/news/home/20141111006545/en/Yahoo-Acquire-BrightRoll>
- Merriam-Webster.com (n.d.). *Publisher*. Retrieved 15 January 2018, from <https://www.merriam-webster.com/dictionary/publisher>
- Merzdovnik, G., Huber, M., Buhov, D., Nikiforakis, N., Neuner, S., Schmiedecker, M., & Weippl, E. (2017). Block me if you can: A large-scale study of tracker-blocking tools. In *Security and Privacy (EuroS&P), 2017 IEEE European Symposium on* (pp. 319-333).
- Meyer, S. (2017a). *EU Privacy Regulations: A Greek Tragedy*. [Blogpost]. Retrieved 4 February 2018, from <https://www.evidon.com/blog/privacy-compliance/greek-tragedy-eu-privacy-regulations/>
- Meyer, S. (2017b). *The Next Chapter: Evidon Joins Crownpeak*. [Blogpost]. Retrieved 4 February 2018, from <https://www.evidon.com/blog/evidon/evidon-joins-crownpeak/>
- MIT Technology Review Custom (2013). *The evolution of ad tech. Going from Mad Men to Math Men. How technology has fundamentally changed the art and science of advertising*. [Blogpost]. MIT Technology Review.
- Mitchell, J. (2016, March 29). *Re: conection*. [Personal correspondence].
- Moeller, B., & Langley, A. (2015, April). *TLS Fallback Signaling Cipher Suite Value (SCSV) for Preventing Protocol Downgrade*

- Attacks*. Retrieved from <http://tools.ietf.org/rfc/rfc7507.txt> (RFC7507)
- Mozilla (2011). *Lightbeam*. [Browser extension]. Retrieved 2 January 2016, from <https://www.mozilla.org/en-US/lightbeam/>
- Mozilla (2018a). *Browse without baggage in Firefox: Set Tracking Protection to always on*. [Blogpost]. Retrieved 1 February 2018, from <https://blog.mozilla.org/firefox/tracking-protection-always-on>
- Mozilla (2018b). *Privacy Possum*. [Firefox add-on]. Retrieved 27 May 2018, from <https://github.com/cowlicks/privacypossum>
- Murray, R., Caulier-Grice, J., & Mulgan, G. (2010). *The open book of social innovation*. London: National Endowment for Science, Technology and the Art.
- Narayanan, A. (2018, March 30). *Re: list of openwpm plugins?* [Personal correspondence].
- Narayanan, A., & Reisman, D. (2017). The princeton web transparency and accountability project. In *Transparent Data Mining for Big and Small Data* (pp. 45–67). Springer.
- Nassri, A. (2015). *HAR Resources: A community curated list of resources, tools, projects and applications that support HTTP Archive (HAR)*. [Github]. Retrieved 28 June 2015, from <https://github.com/ahmadnassri/har>
- Needham, K. (2015). *The Future of Developing Firefox Add-ons*. [Blogpost]. Mozilla Add-ons Blog. Retrieved 19 December 2015, from <https://blog.mozilla.org/addons/2015/08/21/the-future-of-developing-firefox-add-ons/>
- Newman, M., & Girvan, M. (2004). Finding and evaluating community structure in networks. *Physical review E*, 69(2), 026113.
- Nielsen, P., DeMille, V., Kilrain, J., Meyer, S., Donohoo, J., Kozek, E., Van Oss, B., & Signanini, J. (2016, December 15). *Methods, apparatus, and systems for surveillance of third-party digital technology vendors providing secondary content in a content publisher's web page*. Google Patents. (US Patent App. 15/059,296)
- Nikiforakis, N., Joosen, W., & Livshits, B. (2015). Privaricator: Deceiving fingerprinters with little white lies. In *Proceedings of the 24th International Conference on World Wide Web* (pp. 820–830).
- Nikiforakis, N., Kapravelos, A., Joosen, W., Kruegel, C., Piessens, F., & Vigna, G. (2013). Cookieless monster: Exploring the

- ecosystem of web-based device fingerprinting. In *IEEE Symposium on Security and Privacy*. Washington, DC: IEEE.
- Nottingham, M. (2015). *Unsanctioned Web Tracking* (W3C TAG Finding 17 July 2015). [Github]. Retrieved 19 November 2017, from <https://www.w3.org/2001/tag/doc/unsanctioned-tracking>
- NTIA (2010). *Commercial Data Privacy and Innovation in the Internet Economy: A Dynamic Policy Framework*. IPTF Privacy Green Paper. Washington, DC: National Telecommunications and Information Administration (NTIA).
- NWO (2006). *Annotated graph mining*. Available from NWO online database, OND1315812. Nederlandse Organisatie voor Wetenschappelijk Onderzoek, (NWO). Retrieved 3 January 2014, from <http://www.narcis.nl/research/RecordID/OND1315812/Language/en>
- Odvarko, J., Jain, A., & Davies, A. (2012). *HTTP Archive (HAR) format*. W3C Editor's Draft August 14, 2012. Retrieved 19 June 2015, from <https://dvcs.w3.org/hg/webperf/raw-file/tip/specs/HAR/0verview.html>
- OECD (1980). *Guidelines on the Protection of Privacy and Transborder Flows of Personal Data*. Paris: Organisation for Economic Co-operation and Development (OECD) Publishing.
- OECD (2013a). *Exploring Data-Driven Innovation as a New Source of Growth: Mapping the Policy Issues Raised by Big Data*. In *OECD Digital Economy Papers* (Vol. 222). Paris: Organisation for Economic Co-operation and Development (OECD) Publishing. doi: <http://dx.doi.org/10.1787/5k47zw3fcp43-en>
- OECD (2013b). *Revised Guidelines on the Protection of Privacy and Transborder Flows of Personal Data*. Paris: Organisation for Economic Co-operation and Development (OECD) Publishing.
- Ofcom (2015). *Adults' media use and attitudes. Report 2015*. [Report]. Ofcom. Retrieved 5 August 2016, from http://stakeholders.ofcom.org.uk/binaries/research/media-literacy/media-lit-10years/2015_Adults_media_use_and_attitudes_report.pdf
- Olejnik, L., Acar, G., Castelluccia, C., & Diaz, C. (2015). *The leaking battery. A privacy analysis of the HTML5 Battery Status API*. Leuven: International Association for Cryptologic Research (IACR). Retrieved 8 July 2015, from eprint.iacr.org/2015/616.pdf
- Olejnik, L., & Castelluccia, C. (2016). *Analysis of openx-publishers cooperation*.

- O'Neill, M. (2015). *TrackerScope*. Oxford: Baycloud Systems Ltd. Retrieved 2 January 2016, from <https://baycloud.com/>
- O'Neill, M. (2017, December 1). *RE: native speaker question*. [Personal correspondence].
- Oremus, W. (2017). *The Pivot From Advertising. It's time for online media to stop chasing clicks (and Facebook's carrots)*. [Blogpost]. Retrieved 29 January 2018, from <http://www.slate.com/technology/2018/01/how-facebook-s-plan-to-rate-the-media-might-actually-work.html>
- Outsource Ad Ops (2014). *The jobs of ad ops*. [Infographic]. New York, NY: Author. Retrieved 31 January 2015, from <http://visual.ly/job-ad-ops>
- Outsource Ad Ops (2015). *Managing monetization*. [Infographic]. New York, NY: Author. Retrieved 31 January 2015, from <http://visual.ly/managing-monetization>
- Pannetrat, A. (2012). *Cookieminer*. [Google Code Archive]. Retrieved 30 January 2016, from <https://code.google.com/archive/p/cookie-miner/>
- Pannetrat, A. (2016, January 23). *Credits to your programming efforts*. [Personal correspondence].
- Papadopoulos, P., Kourtellis, N., & Markatos, E. (2018). Cookie Synchronization: Everything You Always Wanted to Know But Were Afraid to Ask. *arXiv preprint arXiv:1805.10505*.
- Papadopoulos, P., Rodriguez, P. R., Kourtellis, N., & Laoutaris, N. (2017). If you are not paying for it, you are the product: How much do advertisers pay to reach you? In *Proceedings of the 2017 Internet Measurement Conference* (pp. 142–156).
- Parliament of the EU and the Council (1995, October 24). *Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data*.
- Parliament of the EU and the Council (2000a, December 18). *Directive (EU) 2016/680 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data by competent authorities for the purposes of the prevention, investigation, detection or prosecution of criminal offences or the execution of criminal penalties, and on the free movement of such data, and repealing Council Framework Decision 2008/977/JHA*.
- Parliament of the EU and the Council (2000b, December 18). *Regulation (EC) No 45/2001 of the European Parliament and of the Coun-*

- cil of 18 December 2000 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data.*
- Parliament of the EU and the Council (2002, July 12). *Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications).*
- Parliament of the EU and the Council (2009, November 25). *Directive 2009/136/EC of the European Parliament and of the Council of 25 November 2009 amending Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services, Directive 2002/58/EC concerning the processing of personal data and the protection of privacy in the electronic communications sector and Regulation (EC) No 2006/2004 on cooperation between national authorities responsible for the enforcement of consumer protection laws.* Retrieved 30 December 2015, from <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1414070545086&uri=CELEX:32009L0136>
- Parliament of the EU and the Council (2016). *Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation).*
- Patra, C. (2015). *Amazon DynamoDB: ten things you really should know.* [Blogpost]. CloudAcademy Blog. Retrieved 26 December 2016, from <http://cloudacademy.com/blog/amazon-dynamodb-ten-things/>
- PayPal (2017). *List of Third Parties (other than PayPal Customers) with Whom Personal Information May be Shared.* Retrieved 16 March 2018, from <https://www.paypal.com/ie/webapps/mpp/ua/third-parties-list-prev>
- PayPal (2018). *List of Third Parties (other than PayPal Customers) with Whom Personal Information May be Shared.* Retrieved 16 March 2018, from <https://www.paypal.com/ie/webapps/mpp/ua/third-parties-list>
- Pels, D. (2013, July 5). *Surf-gedrag niet meer te koop: Firefox legt handel in cookies aan banden. Browsers nemen het voortouw in discussie over privacy.* In *Trouw* (p. 16). Amsterdam: Trouw.
- Peon, R., & Ruellan, H. (2015, May). *HPACK: Header Compression for HTTP/2.* Retrieved from <http://tools.ietf.org/rfc/>

- rfc7541.txt (RFC7541)
- Peppet, S. (2014). *Regulating the Internet of Things: First Steps Toward Managing Discrimination, Privacy, Security & Consent. Texas Law Review, Forthcoming.*
- Perez, F. (2001). *Jupyter*. Retrieved 2 December 2017, from <https://jupyter.org/>
- Petitcolas, S. (2013). *CookieViz*. [Github]. Paris: CNIL. Retrieved 4 January 2016, from <https://github.com/LaboCNIL/CookieViz>
- Petnel, R. (2005). *EasyList*. Retrieved 27 November 2017, from <https://easylist.to/pages/about.html>
- Phillips, P. (2015). *From Croissantonomics to Evolution at Warp Speed*. [Blogpost]. LinkedIn.com. Retrieved 12 September 2018, from <https://www.linkedin.com/pulse/from-croissantonomics-evolution-warp-speed-paul-phillips/>
- Pierce, J. (2010). *Ghostery*. [Github]. Retrieved 19 December 2015, from <https://github.com/jonpierce/ghostery>
- Podesta, J., Pritzker, P., Moniz, E., Holdren, J., & Zients, J. (2014). *Big data: seizing opportunities, preserving values*. Washington, DC: Executive Office of the President.
- Poitras, L. (2012). *The Program*. [Documentary]. Praxis Films.
- Poitras, L. (2014). *Citizenfour*. [Documentary]. Praxis Films.
- Polonetsky, J. (2018, January 24). *Re: DSP's and SSP's using tag management to track clicks conversions*. [Personal correspondence].
- Powers, S. (2008). *Learning JavaScript: Add Sparkle and Life to Your Web Pages*. "O'Reilly Media, Inc."
- Pozdnyakov, M., Shalamov, A., Christiansen, K., & Kostiainen, A. (2018). *Orientation Sensor*. W3C Candidate Recommendation, 20 March 2018. Retrieved 30 March 2018, from <https://www.w3.org/TR/2018/CR-orientation-sensor-20180320/>
- R Core Team (2014). *R: A Language and Environment for Statistical Computing* [Computer software manual]. Vienna, Austria. Retrieved 16 June 2015, from <http://www.R-project.org>
- Rannenberg, K. (2017, October 26). *NIST's recent Digital Identity Guidelines missing essential Privacy by design feature*. [IPEN mailinglist].
- Rappaport, S. (2015). *The Digital Metrics Field Guide: The Definitive Reference for Brands Using the Web, Social Media, Mobile Media, Or Email*. Bis B.V., Uitgeverij (BIS Publishers).
- Raschke, P., & Küpper, A. (2018). *Uncovering Canvas Fingerprinting in Real-Time and Analyzing Its Usage for Web Tracking. In Security & Privacy at Large - GI Informatik 2018.*

- Reagan, R. (2013). *Turn Infographic: The Life of an Ad*. [Infographic]. ExchangeWire.com. Retrieved 29 January 2015, from <https://www.exchangewire.com/blog/2013/11/11/turn-infographic-the-life-of-an-ad/>
- Reisman, D., Englehardt, S., Eubank, C., Zimmerman, P., & Narayanan, A. (2014). *Cookies that give you away: Evaluating the surveillance implications of web tracking*. [Draft: April 2, 2014]. Princeton, NJ: Center for Information Technology Policy. Retrieved 30 June 2015, from <http://randomwalker.info/publications/cookie-surveillance.pdf>
- Reitz, K., Benfield, C., Cordasco, I., & Petrov, A. (2011). *Requests: HTTP for Humans*. [Github]. Retrieved 15 December 2015, from <http://docs.python-requests.org/en/latest/index.html#requests-http-for-humans>
- Relay42 (n.d.). *Relay42 tag management*. [Factsheet]. Retrieved 26 January 2018, from <https://form.relay42.com/factsheet/relay42-tag-management>
- Ren, J., Lindorfer, M., Dubois, D. J., Rao, A., Choffnes, D., & Vallina-Rodriguez, N. (2018). Bug Fixes, Improvements,... and Privacy Leaks. In *NDSS*.
- Rescorla, E., & Internet Architecture Board. (2005, June). *Writing Protocol Models*. Retrieved from <http://tools.ietf.org/rfc/rfc4101.txt> (RFC4101)
- Rich, J. (2015, January 21). *Beyond Cookies: Privacy Lessons for Online Advertising*. Washington, DC: Fedetal Trade Commission, Bureau of Consumer Protection.
- Richards, N., & King, J. (2014). Big Data Ethics. *Available at SSRN 2384174*.
- Riesen, K., Jiang, X., & Bunke, H. (2010). Exact and inexact graph matching: Methodology and applications. In C. C. Aggerwal & H. Wang (Eds.), *Managing and Mining Graph Data* (pp. 217–247). Springer.
- Robinson, I., Webber, J., & Eifrem, E. (2015). *Graph databases* (Second Edition ed.). O'Reilly Media, Inc.
- Rosenberg, J., & Jennings, C. (2008, January). *The Session Initiation Protocol (SIP) and Spam*. Retrieved from <http://tools.ietf.org/rfc/rfc5039.txt> (RFC5039)
- Rosenstein, M., Collins, J., & De Luca, C. (1993). A practical method for calculating largest Lyapunov exponents from small data sets. *Physica D: Nonlinear Phenomena*, 65(1), 117–134.

- Russell, A., Son, J., Archibald, J., & Kruisselbrink, M. (2018). *Service Workers 1*. W3C Editor's Draft, 13 January 2018. Retrieved 31 January 2018, from <https://w3c.github.io/ServiceWorker/v1>
- Russom, P. (2011). Big data analytics. *TDWI Best Practices Report, Fourth Quarter*. Retrieved 14 April 2014, from <http://public.dhe.ibm.com/common/ssi/ecm/en/iml14293usen/IML14293USEN.PDF>
- Rutgers, A. (2008). *Anonymous Subscriber ID (ASID) - A Mobile Web Site Developers Cookbook*. [Blogpost]. Open Mobiel Internet. Retrieved 30 December 2015, from <http://www.t-mobile.nl/corporate/media/pdf/asid-omi-cookbook.pdf>
- Ryan, J. (2017). *Deck at GDPR Summit at Croke Park*. [Presentation]. Dublin: pageFair. Retrieved 28 January 2018, from <https://www.slideshare.net/JohnnyRyan/deck-at-gdpr-summit-at-croke-park>
- Ryan, J. (2018). *Re: Feedback on Guidelines on Consent under Regulation 2016/679 (wp259)*. [Letter]. Retrieved 6 July 2018, from <https://www.dropbox.com/s/cnumg4rcw5j7im3/Letter%20to%20Article%2029%20Working%20Party%2C%2023%20January%202018.pdf>
- Savard, D., & Co, N. (2011). *Live HTTP Headers*. [Mozdev repository]. Retrieved 21 December 2015, from <http://www.mozdev.org/source/browse/livehttpheaders/>
- Scheepers, K. (2018). *Respect voor de meldplicht: de motieven achter het overtreden van de meldplicht datalekken bij de Autoriteit Persoonsgegevens*. Master's thesis. Leiden: Instituut voor Strafrecht en Criminologie, Leiden University.
- Scheitle, Q., Jelten, J., Hohlfeld, O., Ciprian, L., & Carle, G. (2018). Structure and Stability of Internet Top Lists. *arXiv preprint arXiv:1802.02651*.
- Schermer, B. (2007). *Software agents, surveillance, and the right to privacy : a legislative framework for agent-enabled surveillance*. PhD thesis. Leiden: Leiden University Press.
- Schneider, M., Enzmann, M., & Stopczynski, M. (2014). *Web-tracking-report 2014*. Fraunhofer-Institut für Sichere Informationstechnologie (SIT) technical report, SIT-TR-2014-01. Darmstadt: Fraunhofer Verlag.
- Schneier, B. (2013). *Metadata Equals Surveillance*. [Blogpost]. Retrieved 8 March 2014, from https://www.schneier.com/blog/archives/2013/09/metadata_equals.html

- Schoch, D. (2015). *A Positional Approach for Network Centrality* (Unpublished doctoral dissertation). Ph. D. dissertation, Universität Konstanz.
- Schütte, J. (2011). *Prividor*. Fraunhofer-Institut für Angewandte und Integrierte Sicherheit. Garching: Fraunhofer AISEC. Retrieved 15 July 2015, from <http://www.aisec.fraunhofer.de/de/fields-of-expertise/projekte/prividor.html>
- Secretary of State (2018). *An act to add Title 1.81.5 (commencing with Section 1798.100) to Part 4 of Division 3 of the Civil Code, relating to privacy (AB-375)*. Retrieved 29 June 2018, from http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180AB375.
- Selenium Project (2004). Selenium Documentation [Computer software manual]. Retrieved 17 June 2015, from <http://www.seleniumhq.org/docs/>
- Shannon, C. (1948). A mathematical theory of communication. In *Bell System Technical Journal* (Vol. 27, pp. 379–423, 623–656). American Telephone and Telegraph Co.
- Shaw, M. E. (1954). Group structure and the behavior of individuals in small groups. *The Journal of psychology*, 38(1), 139–149.
- Shields, R. (2014). *The Rise Of The Mega Stacks*. [Blog-post]. ExchangeWire.com. Retrieved 18 September 2014, from <https://www.exchangewire.com/blog/2014/09/15/the-rise-of-the-mega-stacks/>
- Shimbel, A. (1953). Structural parameters of communication networks. *The bulletin of mathematical biophysics*, 15(4), 501–507.
- SIDN (2014). *Jaarverslaggeving over 2014*. Arnhem: Stichting Internet Domeinregistratie Nederland (SIDN). Retrieved 21 June 2015, from <https://www.sidn.nl/contentAsset/raw-data/1fa00328-fb77-4daf-9c4c-7fa33b076541/fileAsset>
- Singer, D. (2015, May 27). *Re: question on HTTP header fields*. [Personal correspondence].
- Singer, N. (2012a). Anúncios em sites são vendidos em leilões no momento em que o internauta visita a página. In *Folha de S.Paulo*. São Paulo: Folha de S.Paulo.
- Singer, N. (2012b). Empresas de marketing calculan al instante las opciones de compra del internauta. Preocupación por la discriminación del público según su nivel adquisitivo. In *El País*. Madrid: El País.

- Singer, N. (2012c, November 18). You for sale: Your Attention, Bought in an Instant. In *New York Times* (p. BU1). New York, NY: New York Times.
- Smith, C. (2014). *FBX Is Turning Facebook Into One Of The Biggest Players In The Real-Time Bidding Space*. [Blog-post]. Business Insider. Retrieved 13 June 2015, from <http://www.businessinsider.com/explaining-fbx-facebook-exchange-2-2014-1?IR=T>
- Snowden, E. (2014). *Testimony to the European Parliament*. Retrieved 13 March 2014, from <http://www.europarl.europa.eu/document/activities/cont/201403/20140307ATT80674/20140307ATT80674EN.pdf>
- Soghoian, C. (2011). *The History of the Do Not Track Header*. [Blog-post]. Retrieved 4 April 2014, from <http://paranoia.dubfire.net/2011/01/>
- Soltani, A. (2014). *More evidence of the NSA piggybacking on commercial tracking by Google, Yahoo, Facebook in order to identify users*. [Twitter]. Retrieved 25 May 2015, from <https://twitter.com/ashk4n/status/443771573489913856/photo/1>
- Soltani, A., Cortesi, A., & Campbell, D. (2012). *MobileScope [Computer software manual]*. Retrieved 21 June 2015, from <http://ashkansoltani.org/work/mobile/#mobilescope>
- Some, D., Rezk, T., & Bielova, N. (2018). *Web Stats*. [Blogpost]. Retrieved 31 March 2018, from <https://webstats.inria.fr/popjslibs.php>
- Sørensen, J., & van den Bulck, H. (2018). Public Service Media Online, Advertising and the Third-Party User Data Business: A Trade versus Trust Dilemma? *Convergence. the International Journal of Research Into New Media Technologies*.
- Starov, O., & Nikiforakis, N. (2017a). Extended tracking powers: Measuring the privacy diffusion enabled by browser extensions. In *Proceedings of the 26th International Conference on World Wide Web* (pp. 1481–1490).
- Starov, O., & Nikiforakis, N. (2017b, May). XHOUND: Quantifying the Fingerprintability of Browser Extensions. In (pp. 941–956). IEEE. Retrieved 2018-04-02, from <http://ieeexplore.ieee.org/document/7958618/> doi: 10.1109/SP.2017.18
- Stewart, S., & Burns, D. (2018). *Webdriver*. W3C Proposed Recommendation 26 April 2018. Retrieved 27 May 2018, from <https://www.w3.org/TR/webdriver/>

- Swift, M. (2014, June 20). Advertising groups blast 'Do Not Track' effort, but European and US leaders push privacy plan forward. In *MLex Market Insight*. Brussels/San Francisco: MLex.
- Swire, P. (2013). *Explanatory Memorandum for Working Group Decision on "What Base Text to use for the Do Not Track Compliance Specification"*. Retrieved 27 July 2015, from <http://www.w3.org/2011/tracking-protection/2013-july-decision/>
- Swire, P. (2015). *US Surveillance Law, Safe Harbor, and Reforms since 2013*. Retrieved 18 December 2015, from <http://fpf.org/wp-content/uploads/2015/12/White-Paper-Swire-US-EU-Surveillance.pdf>
- Swire, P. (2017). *Professor Peter Swire Testimony in Irish High Court Case*. [Expert report]. Retrieved 1 October 2017, from <https://www.alston.com/en/resources/peter-swire-irish-high-court-case-testimony>
- Swire, P., Morell, M., Stone, G., Sunstein, C., & Clarke, R. (2013). *Liberty and security in a changing world. Report and Recommendations of The President's Review Group on Intelligence and Communications Technologies*. . Washington, DC: Executive Office of the President.
- Takes, F. (2014). *Algorithms for Analyzing and Mining Real-World Graphs* (Unpublished doctoral dissertation). Ph. D. dissertation, Leiden Institute of Advanced Computer Science (LIACS), Faculty of Science, Leiden University.
- Takes, F. (2018, September 9). *Re: Nieuwe versie (na bijeenkomst 6/9/2018)*. [Personal correspondence].
- Tawakol, O. (2016). *Letter to Customers and Partners*. [Blog-post]. Retrieved 9 April 2018, from <https://www.oracle.com/corporate/acquisitions/addthis/letter.html>
- The Tor Project (2015). *Tor web browser*. Cambridge, MA: The Tor Project, Inc. Retrieved 15 August 2015, from <https://www.torproject.org/>
- Theus, M., & Urbanek, S. (2008). *Interactive Graphics for Data Analysis: Principles and Examples*. Taylor & Francis.
- Thibault, C. (2013). *Game Data Analysis—Tools and Methods*. Birmingham: Packt Publishing Ltd.
- Thieurmél, B. (2016). *visNetwork: an R package for network visualization, using the vis.js javascript library* [Computer software manual]. Retrieved 1 march 2018, from <https://datastorm-open.github.io/visNetwork/>

- Thode, W., Griesbaum, J., & Mandl, T. (2015). 'I would have never allowed it': User Perception of Third-party Tracking and Implications for Display Advertising. In F. Pehar, C. Schlögl, & C. Wolff (Eds.), *Re: inventing Information Science in the Networked Society*. (pp. 445–456). Glückstad: Verlag Werner Hülsbusc.
- Thomas, C., Kline, J., & Barford, P. (2016). IntegraTag: a framework for high-fidelity web client measurement. In *Teletraffic Congress (ITC 28), 2016 28th international* (Vol. 1, pp. 278–285).
- Thomas, K. (1962). The structure of scientific revolutions.
- Thompson, K. (1968). Programming Techniques: Regular expression search algorithm. *Communications of the ACM*, 11(6), 419–422. doi: <http://dx.doi.org/0.1145/363347.363387>
- Tillmann, H. (2013). *Browser Fingerprinting: Tracking ohne Spuren zu hinterlassen*. Master's thesis. Berlin: Humboldt University, Institut für Informatike.
- Towvim, A. (2018, February 16). *Re: Re: DSP's and SSP's using tag management to track clicks / conversions?* [Personal correspondence].
- Traverso, S., Trevisan, M., Giannantoni, L., Mellia, M., & Metwalley, H. (2017). Benchmark and comparison of tracker-blockers: Should you trust them? In *Network Traffic Measurement and Analysis Conference (TMA), 2017* (pp. 1–9).
- Trevisan, M., Traverso, S., Metwalley, H., & Mellia, M. (2017). *Uncovering the Flop of the EU Cookie Law*. arXiv preprint arXiv:1705.08884.
- Tschofenig, H. (2013, July 11). *Writing Protocol Models*. [public-privacy (W3C mailing list)].
- Tschofenig, H. (2015, June 14). *Re: question on HTTP header fields*. [Personal correspondence].
- Tschofenig, H., & Van Eijk, R. (2011). Do Not Track, An Attempt to Frame the Debate. In *W3C workshop Web Tracking and User Privacy*. Princeton, NJ: W3C. [Position paper]. Retrieved 11 January 2014, from <http://www.w3.org/2011/track-privacy/papers/Tschofenig.pdf>
- Tukey, J. (1977). *Exploratory data analysis* (Vol. 2). Reading, Mass.
- Turcios Rodríguez, E. (2018). *Tracking cookies in the European Union, an empirical analysis of the current situation*. Master's thesis. Delft: Delft University of Technology.
- Unspam Technologies (n.d.). Project Honey Pot [Computer software manual]. Park City, Utah: Author. Retrieved 10 July 2015, from <http://www.projecthoneypot.org/faq.php>

- Van den Herik, H. J., & Van Eijk, R. (2013). Social Innovation & Big Data. In *IT Innovation Day*. Amersfoort: IDG Nederland. [Presentation].
- Van den Herik, H. J., & Van Eijk, R. (2014). The all-pervasive impact of Big Data in daily life: from Causality to Correlation. In *Launch of the Future Center - Smart Systems*. Leiden: Leiden Institute of Advanced Computer Science, Leiden University. [Presentation].
- Van den Herik, H. J., & Van Eijk, R. (2015). Big Data: een Introductie. In *Ondernemen en Big Data*. The Hague: VNO-NCW WEST. [Presentation].
- Van den Herik, H. J., & Van Eijk, R. (2016). De haakjes van Big Data. In *(Big) Data festival*. The Hague: Ministry of Infrastructure and Environment. [Presentation].
- Van der Hout, A. (2015, December 18). *Ad networks in the Netherlands*. [Personal correspondence].
- Van Eijk, R. (2011a). *Web Tracking Detection System (TDS)*. [Github]. Retrieved 1 January 2015, from <https://github.com/rvaneijk/TDS>
- Van Eijk, R. (2011b). *Web Tracking Detection System (TDS): An effective strategy to reduce systematic monitoring and profiling of user habits across websites*. MSc thesis. Leiden: Leiden University, Leiden Institute of Advanced Computer Science. Retrieved 5 March 2018, from <http://liacs.leidenuniv.nl/assets/Masterscripties/ICTiB/Rob-van-Eijk-non-confidential.pdf>
- Van Eijk, R. (2012). *The DNA of OBA: unique identifiers*. Retrieved 21 June 2015, from <http://web.archive.org/web/20141219090611/http://www.campusden Haag.nl/crk/publicaties/robvaneijk.html>
- Van Eijk, R. (2016a). *A brief introduction to Real Time Bidding (RTB)*. [Presentation]. Brussels: Article 29 Working Party. doi: <http://dx.doi.org/10.2139/ssrn.2856941>
- Van Eijk, R. (2016b). Informatie: Leidt meer informatie tot minder vrijheid? In A. in 't Groen, C. De Roon, & P. Slaman (Eds.), *Leids-Haags Allegorieënlexicon* (pp. 151–160). Delft: Uitgeverij Eburon.
- Van Eijk, R. (2017). Tracking classification: a cluster analysis approach to identify missing values. In N. Bielova, N. Laoutaris, A. Narayanan, & N. Nikiforakis (Eds.), (Vol. 7, p. 103). Dagstuhl, Germany: Schloss Dagstuhl–Leibniz-Zentrum für In-

- formatik. [Peer Reviewed Report]. doi: <http://dx.doi.org/10.4230/DagRep.7.4.83>
- Van Eijk, R. (2018). *Technology for Privacy: Protecting Against Online Tracking and Profiling*. [Presentation]. Brussels: Computers, Privacy, and Data Protection congress. doi: <http://dx.doi.org/10.2139/ssrn.3106582>
- Van Eijk, R., & Chester, J. (2014, July 28). *Recent Mergers & Acquisitions Involving Data Driven Marketing Companies*. [Personal correspondence].
- Van Eijk, R., & Chester, J. (2015, February 4). *RE: key mergers Jan 2013 - June 2014*. [Personal correspondence].
- Van Eijk, R., & Cortesi, A. (2016, August 24). *Tracking detection*. [Personal correspondence].
- Van Eijk, R., & Terra, F. (2012). *Cookie ID crawler*. [Github, private repository]. Retrieved 27 July 2015, from <https://github.com/rvaneijk/cookie-id-crawler>
- Van Eijk, R., & Terra, F. (2013). *Python script to read high entropy cookies from MITMDUMP and store these in a Neo4j property graph*. [Github, private repository]. Retrieved 16 August 2016, from <https://github.com/rvaneijk/cookie-id-crawler>
- Van Eijk, R., & Toubiana, V. (2016). *Python script to read high entropy cookies from OpenWPM and store these in a Neo4j property graph*. [Github]. Retrieved 16 August 2016, from <https://github.com/rvaneijk/openWPM-to-Neo4j>
- Van Kesteren, A., Gregor, A., Ms2ger, Russel, A., & Berjon, R. (2015). *W3C DOM4*. W3C Last Call Working Draft 18 June 2015. Retrieved 22 June 2015, from <http://www.w3.org/TR/dom/> (DOM 4)
- Van Goethem, T., & Joosen, W. (2017). One side-channel to bring them all and in the darkness bind them: Associating isolated browsing sessions.
- Vastel, A., Rudametkin, W., & Rouvoy, R. (2018). FP-TESTER: Automated Testing of Browser Fingerprint Resilience. In *IWPE 2018-4th International Workshop on Privacy Engineering* (pp. 1–5).
- Verhulst, D. (2012). *VMC-studiemiddag*. In *Mediaforum: Tijdschrift voor media- en communicatierecht*. Amsterdam: Cramwinckel.
- Vines, P., Roesner, F., & Kohno, T. (2017). Exploring ADINT: Using Ad Targeting for Surveillance on a Budget-or-How Alice Can Buy Ads to Track Bob. In *Proceedings of the 2017 on Workshop on Privacy in the Electronic Society* (pp. 153–164).

- Wagner, S., & Neshat, N. (2010). Assessing the vulnerability of supply chains using graph theory. *International Journal of Production Economics*, 126(1), 121–129.
- Wainberg, D. (2015, December 19). *Transitivity, DNT tracking status resource*. [Personal correspondence].
- Waldron, R., Pozdnyakov, M., & Shalamov, A. (2018). *Generic Sensor API*. W3C Candidate Recommendation, 20 March 2018. Retrieved 30 March 2018, from <https://www.w3.org/TR/2018/CR-generic-sensor-20180320/>
- Wang, J., Yuan, S., & Cai, K. (2015). *Real-Time Bidding based Display Advertising: Mechanisms and Algorithms*. *Real-Time Bidding A New Frontier of Computational Advertising Research*. [Presentation]. Padua: ACM International Conference on Web Search and Data Mining (WSD 2015). Retrieved 6 August 2016, from <http://tutorial-wsdm-2015.computational-advertising.org/images/WSDM2015.pdf>
- Wang, J., Yuan, S., & Zhang, W. (2016). *Real-Time Bidding based Display Advertising: Mechanisms and Algorithms*. [Presentation]. Padua: European Conference on Information Retrieval (ECIR 2016). Retrieved 6 August 2016, from <http://tutorial.computational-advertising.org/final-slides.pdf>
- Warren, S., & Brandeis, L. (1890). The right to privacy. *Harvard law review*, 193–220.
- Web Tracking and User Privacy. (2011, April 28-29). [Workshop report]. Princeton, NJ: W3C. Retrieved 11 April 2014, from <http://www.w3.org/2011/track-privacy/report.html>
- Wefers Bettink, W., Van Eijk, R., & Wagner, F. (2012). *Strictly Speaking: Cookies, Consent and Compliance*. Europe Data Protection congress. [Presentation]. Brussels: IAPP.
- Westin, A. (1967). *Privacy and freedom*. New York, NY: Atheneum.
- WHATWG (2015, December). *HTML Living Standard*. Last updated 11 December 2015. Retrieved from <http://html.spec.whatwg.org>
- Wheaton Lexomics (2012). *How to read a dendrogram*. [Video]. Wheaton College Massachusetts. Retrieved 18 February 2019, from <https://www.youtube.com/watch?v=MX6AUX1b1w0>
- White, N. (2014). *RNeo4j: interact with a Neo4j database in R*. [Github]. Retrieved 16 June 2015, from <http://nicolewhite.github.io/RNeo4j/docs/>
- White, T. (2012). *Hadoop: The definitive guide*. Sebastopol, CA: O'Reilly Media, Inc.

- Wilander, J. (2017). *Intelligent Tracking Prevention*. [Blogpost]. Retrieved 18 October 2017, from <https://webkit.org/blog/7675/intelligent-tracking-prevention/>
- Wilde, T., & Hess, T. (2007). Forschungsmethoden der wirtschaftsinformatik. *Wirtschaftsinformatik*, 49(4), 280–287.
- Wiley, S. (2017, May 2). *Re: congratulations and data set question*. [Personal correspondence].
- Wills, C. (2012, June 20). *WPM Privacy Measurement Bibliography follow-up*. [Personal correspondence].
- Yahoo (2002). *Yahoo! Search Marketing Advertiser Bidding Data, version 1.0*. [Dataset]. Retrieved 30 April 2017, from <https://webscope.sandbox.yahoo.com/catalog.php?datatype=a>
- Yahoo (2014). *Yahoo! Data Targeting User Modeling, Version 1.0*. [Dataset]. Retrieved 30 April 2017, from <https://webscope.sandbox.yahoo.com/catalog.php?datatype=a>
- Yonan, J. (2001). *OpenVPN*. Retrieved 2 December 2017, from <https://openvpn.net/index.php/open-source.html>
- Youyou, W., Kosinski, M., & Stillwell, D. (2015). Computer-based personality judgments are more accurate than those made by humans. *Proceedings of the National Academy of Sciences*, 112(4), 1036–1040.
- Yu, Z., Macbeth, S., Modi, K., & Pujol, J. M. (2016). Tracking the trackers. In *Proceedings of the 25th International Conference on World Wide Web* (pp. 121–132).
- Yuan, H., Maple, C., Chen, C., & Watson, T. (2018). Cross-device tracking through identification of user typing behaviours. *Electronics Letters*, 54(15), 957–959.
- Zevenbergen, B., Brown, I., Wright, J., & Erdős, D. (2013). Ethical Privacy Guidelines for Mobile Connectivity Measurements. *Available at SSRN 2356824*.
- Zhang, W., Yuan, S., & Wang, J. (2014). Optimal Real-Time Bidding for Display Advertising. In *Proceedings of the 20th ACM SIGKDD international conference on knowledge discovery and data mining*.
- Zhang, W., Yuan, S., Wang, J., & Shen, X. (2014). Real-Time Bidding Benchmarking with iPinYou Dataset. *arXiv preprint arXiv:1407.7073*.
- Zhou, Z., Diao, W., Liu, X., & Zhang, K. (2014). Acoustic fingerprinting revisited: Generate stable device id stealthily with inaudible sound. In *Proceedings of the 2014 ACM SIGSAC Conference on Computer and Communications Security* (pp. 429–440).

- Zorbas, K. (2015, December 12). *Ad networks in the Netherlands*. [Personal correspondence].
- Zuiderveen Borgesius, F. (2014). *Improving Privacy Protection in the Area of Behavioural Targeting*. PhD thesis. Amsterdam: University of Amsterdam.
- Zuiderveen Borgesius, F. (2015). Personal data processing for behavioural targeting: which legal basis? *International Data Privacy Law*, 5(3), 163.
- Zuiderveen Borgesius, F., & McDonald, A. M. (2015). Do Not Track for Europe. In *43rd Research Conference on Communication, Information and Internet Policy (Telecommunications Policy Research Conference)*. Available at SSRN: 2588086.

