

- [1] M. A. A. Montaser, B. P. Ghosh, A. Barua, F. Karim, B. C. Das, R. E. R. Shawon, and M. S. R. Chowdhury, “Sentiment analysis of social media data: Business insights and consumer behavior trends in the usa,” *Edelweiss Applied Science and Technology*, vol. 9, no. 1, pp. 515–535, 2025. [Online]. Available: <https://learning-gate.com/index.php/2576-8484/article/view/4164>
- [2] W. A. Social. (2025, Feb.) Digital 2025: The essential guide to the global state of digital. We Are Social; Meltwater. Diakses pada 29 Mei 2025. [Online]. Available: <https://wearesocial.com/id/blog/2025/02/digital-2025/>
- [3] M. Mundaden, “2025 social media industry benchmark report,” 2025. [Online]. Available: <https://www.rivaliq.com/blog/social-media-industry-benchmark-report/>
- [4] M. Sheikh, “Social media demographics to inform your 2025 strategy,” <https://sproutsocial.com/insights/new-social-media-demographics/>, 2025, diakses 1 Juni 2025.
- [5] I. Mysiuk and R. Shuvar, “Automating web scraping of user comments for sentiment analysis in social networks,” in *2023 IEEE 13th International Conference on Electronics and Information Technologies (ELIT)*, 2023, pp. 77–81.
- [6] R. Tromble, “Where have all the data gone? a critical reflection on academic digital research in the post-api age,” *Social Media + Society*, vol. 7, no. 1, pp. 1–8, 2021.
- [7] D. Glez-Peña, A. Lourenço, H. López-Fernández, F. Fdez-Riverola, and M. Reboiro-Jato, “Web scraping technologies in an api world,” in *Proceedings of the 8th International Conference on Practical Applications of Computational Biology & Bioinformatics (PACBB 2014)*, ser. Advances in Intelligent Systems and Computing, vol. 294. Springer, 2014, pp. 45–52.
- [8] M. Clarkson. (2024) How to scrape instagram — the ultimate guide (python). Diakses 1 Juni 2025. [Online]. Available: <https://matthewclarkson.com.au/blog/how-to-scrape-instagram-ultimate-guide/>
- [9] Meta Platforms. (2025) Rate limits — graph api & instagram. <https://developers.facebook.com/docs/graph-api/overview/rate-limiting/>. Dokumentasi resmi, diakses 1 Juni 2025.
- [10] B. Ališauskas. (2025) How to scrape instagram in 2025. [Online]. Available: <https://scrapfly.io/blog/how-to-scrape-instagram/>
- [11] H. Laadhari. (2025) Chrome extension network interception: The modern way to scrape instagram (and beyond). DEV Community, diakses 23 Juni 2025. [Online]. Available: [https://dev.to/hamdi\\_laadhari](https://dev.to/hamdi_laadhari)
- [12] K. Piyumantha, J. Senanayake, and K. Wijayasiriwardhane, “DroidKey: A Practical Framework and Analysis Tool for API Key Security in Android Applications,” in *2025 International Research Conference on Smart Computing and Systems Engineering (SCSE)*, 2025.

- [15] B. Gibson, S. Townes, D. Lewis, and S. Bhunia, "Vulnerability in Massive API Scraping: 2021 LinkedIn Data Breach," in *2021 International Conference on Computational Science and Computational Intelligence (CSCI)*, 2021, pp. 777–782.
- [14] M. Kim and N. Kim, "Mining Hidden and Fragmented API Usages in Android Applications," *Applied Sciences*, vol. 10, no. 24, p. 9048, 2020.
- [15] A. Himawan, A. Priadana, and A. W. Murdiyanto, "Implementation of Web Scraping to Build a Web-Based Instagram Account Data Downloader Application," *IJID (International Journal on Informatics for Development)*, vol. 9, no. 2, pp. 59–65, 2020.
- [16] M. Krysan. (2024, oct) Instagram private api: What you need to know. [Online]. Available: <https://data365.co/instagram-private-api>
- [17] Apify. (2025) Make – instagram actor integration. [Online]. Available: <https://docs.apify.com/platform/integrations/make/instagram>
- [18] I. Camargo-Henríquez and Y. Núñez-Bernal, "A Web Scraping based approach for data research through social media: An Instagram case," in *2022 V Congreso Internacional en Inteligencia Ambiental, Ingeniería de Software y Salud Electrónica y Móvil (AmITIC)*, 2022.
- [19] H. Teotia, G. Shishodia, E. Tyagi, A. Prakash, and S. Avashthi, "Instagram Analysis and Activity Automation: Using Python and Selenium Automation Tools," in *2023 International Conference on Computational Intelligence, Communication Technology and Networking (CICTN)*, 2023, pp. 522–526.
- [20] Subzeroid, "Instagrapi: Unofficial instagram api for python," <https://github.com/subzeroid/instagrapi>, 2025.
- [21] A. Smith. (2025) Instamancer: Scrape instagram's api with puppeteer. <https://github.com/ScriptSmith/instamancer>.
- [22] M. A. Khder, "Web Scraping or Web Crawling: State of Art, Techniques, Approaches and Application," *International Journal of Advanced Soft Computing and its Applications*, vol. 13, no. 3, 2021.
- [23] A. Abodayeh, R. Hejazi, W. Najjar, L. Shihadeh, and R. Latif, "Web Scraping for Data Analytics: A BeautifulSoup Implementation," in *2023 Sixth International Conference of Women in Data Science at Prince Sultan University (WiDS PSU)*, 2023, pp. 65–69.
- [24] Python Software Foundation. (2025) What is python? executive summary. [Online]. Available: <https://www.python.org/doc/essays/blurb/>
- [25] D. Flanagan, *JavaScript: The definitive guide: Master the world's most-used programming language*. O'Reilly Media, 2020.
- [26] M. Haverbeke, *Eloquent JavaScript: A Modern Introduction to Programming*, 3rd ed. No Starch Press, 2018.

[27] Node.js Foundation, "About node.js," <https://nodejs.org/en/about>, 2024, accessed: 2025-07-03.

- [28] M. Cantelon, M. Harter, T. Holowaychuk, and N. Rajlich, *Node.js in Action*. Manning Publications, 2014.
- [29] (2025) About instagram. Instagram. [Online]. Available: <https://about.instagram.com/>
- [30] S. S. Song and Y.-M. Kim, "A big data-driven approach for content analysis: A case of web scraping on a news website," *Journal of Information Science Theory and Practice*, vol. 7, no. 2, pp. 6–19, 2019.
- [31] A. Al-Hassan, R. Al-Sayyed, and Y. Al-Issa, "A survey on web scraping: State-of-the-art and research directions," *Journal of King Saud University - Computer and Information Sciences*, vol. 34, no. 10, pp. 8345–8361, 2022.
- [32] V. Krotov and L. Silva, "Legality and ethics of web scraping," *Communications of the Association for Information Systems*, vol. 43, no. 1, pp. 53–67, 2018.
- [33] Y. Liu and S. Ram, "Web scraping for big data acquisition: A review of the literature," in *Proceedings of the 53rd Hawaii International Conference on System Sciences*, 2020, pp. 5236–5245.
- [34] G. Leban, B. Fortuna, and D. Mladenović, "Web scraping: A survey," *ACM Computing Surveys*, vol. 54, no. 6, pp. 1–36, 2021.
- [35] M. Mladenović and N. Vajda, "Modern web scraping techniques: A performance comparison," in *2020 19th International Symposium INFOTEH-JAHORINA (INFOTEH)*, 2020, pp. 1–5.
- [36] E. Vargiu and M. Urru, "Exploiting web scraping in a collaborative filtering-based approach to web advertising," in *Artificial Intelligence and Soft Computing*. Springer, 2016, pp. 539–549.
- [37] W. Loosen, J. Reimer, and F. Deike, "Data-driven reporting: An on-going (r)evolution? an analysis of objects, competencies, and workflows of data journalism in germany, austria, and switzerland," *Journalism*, vol. 19, no. 9-10, pp. 1248–1264, 2018.
- [38] I. Ayres, "The ethics of scraping," *The Yale Law Journal Forum*, vol. 130, pp. 272–293, 2020.
- [39] K. Martin and H. Nissenbaum, "The ethics of web scraping and the implications for big data," *Journal of the Association for Information Science and Technology*, vol. 67, no. 8, pp. 1817–1826, 2016.
- [40] D. G. Baird, "The law and economics of scraping," *The Coase-Sandor Institute for Law & Economics Working Paper*, no. 803, 2017.
- [41] E. J. Chikofsky and J. H. Cross, II, "Reverse engineering and design recovery: a taxonomy," *IEEE software*, vol. 7, no. 1, pp. 13–17, 1990.

- [42] M. Sikorski and A. Honig, *Practical malware analysis: the hands-on guide to dissecting malicious software*. No Starch Press, 2012.
- [43] P. Messina, L. Bozzato, E. Coppa, and C. Demetrescu, “A mobile application analysis pipeline for large-scale experiments,” in *2020 IEEE 13th International Conference on Software Testing, Verification and Validation (ICST)*. IEEE, 2020, pp. 343–354.
- [44] S. Keltanen and T. Al-Kharraz, *Practical mobile forensics: Forensically investigate and analyze iOS, Android, and Windows 10 devices*. Packt Publishing Ltd, 2017.
- [45] S. Munzert, C. Rubba, P. Meißner, and D. Nyhuis, *Automated data collection with R: A practical guide to web scraping and text mining*. John Wiley & Sons, 2014.
- [46] D. Glez-Peña, A. Lourenço, H. López-Fernández, M. Reboiro-Jato, and F. Fdez-Riverola, “Web scraping: A survey,” *Expert Systems with Applications*, vol. 116, pp. 370–384, 2019.
- [47] R. Mitchell, *Scraping the web with Python: collecting more data from the modern web*. O’Reilly Media, 2018.
- [48] L. Richardson and S. Ruby, *RESTful web APIs*. O’Reilly Media, 2013.
- [49] S. Newman, *Building microservices: designing fine-grained systems*. O’Reilly Media, 2021.
- [50] R. T. Fielding, “Architectural styles and the design of network-based software architectures,” Ph.D. dissertation, University of California, Irvine, 2000.
- [51] adw0rd and contributors, “Instagrapi: Unofficial instagram private api for python,” <https://github.com/adw0rd/instagrapi>, 2021, accessed: 2025-07-03.
- [52] K. Turnbull and S. P. Matthias, *Docker: Up & Running: Shipping Reliable Containers in Production*. O’Reilly Media, 2016.
- [53] D. Merkel, “Docker: lightweight linux containers for consistent development and deployment,” *Linux journal*, vol. 2014, no. 239, p. 2, 2014.
- [54] Prometheus Authors, “Overview - prometheus documentation,” <https://prometheus.io/docs/introduction/overview/>, 2024, accessed: 2025-07-03.
- [55] J. Volz and B. Rabenstein, “Prometheus: A next-generation monitoring system,” in *Proceedings of the USENIX Symposium on Operating Systems Design and Implementation (OSDI)*, 2016.
- [56] B. Beyer, C. Jones, J. Petoff, and N. R. Murphy, *Site Reliability Engineering: How Google Runs Production Systems*, C. Karamanolis et al., Eds. O’Reilly Media, 2016.
- [57] Grafana Labs, “Introduction to grafana,” <https://grafana.com/docs/grafana/latest/introduction/>, 2024, accessed: 2025-07-03.
- [58] J. Perto, “What is grafana and how does it work?” <https://www.influxdata.com/what-is-grafana/>, 2023, accessed: 2025-07-03.

- [59] Microsoft, "Playwright - fast and reliable end-to-end testing for modern web apps," <https://playwright.dev/docs/intro>, 2024, accessed: 2025-07-03.
- [60] Kaliiiiiviiii-Vinyzu, "Patchright: A patched playwright to be not detected," <https://github.com/Kaliiiiiiviiii-Vinyzu/patchright>, 2023, accessed: 2025-07-03.
- [61] Google, "Puppeteer - devtools protocol," <https://pptr.dev/>, 2024, accessed: 2025-07-03.
- [62] D. Beresnev, "puppeteer-extra-plugin-stealth," <https://www.npmjs.com/package/puppeteer-extra-plugin-stealth>, 2024, accessed: 2025-07-03.
- [63] C. Gormley and Z. Tong, *Elasticsearch: The Definitive Guide*. O'Reilly Media, 2015.
- [64] Elastic, "What is elasticsearch?" <https://www.elastic.co/what-is/elasticsearch>, 2024, accessed: 2025-07-03.
- [65] D. Lane, D. Scott, M. Hebl, R. Guerra, D. Osherson, and H. Zimmer, *Introduction to Statistics*. Citeseer, 2003. [Online]. Available: <https://onlinestatbook.com/>
- [66] A. Field, *Discovering statistics using IBM SPSS statistics*. Sage Publications, 2013.
- [67] D. J. Sheskin, *Handbook of parametric and nonparametric statistical procedures*, 4th ed. CRC Press, 2007.
- [68] S. Siegel and N. J. Castellan Jr., *Nonparametric statistics for the behavioral sciences*, 2nd ed. McGraw-Hill, 1988.
- [69] StarNgage. (2025) Top 1,000 instagram influencers in indonesia | starngage plus. [Online]. Available: <https://starngage.com/plus/en-us/influencer/ranking/instagram/indonesia>
- [70] R. Indonesia. (2022) Undang-undang republik indonesia nomor 27 tahun 2022 tentang perlindungan data pribadi. [https://jdih.setkab.go.id/PUUdoc/176837/Salinan\\_UU\\_Nomor\\_27\\_Tahun\\_2022.pdf](https://jdih.setkab.go.id/PUUdoc/176837/Salinan_UU_Nomor_27_Tahun_2022.pdf).
- [71] N. K. R. Indonesia. (2016) Undang-undang republik indonesia nomor 19 tahun 2016 tentang perubahan uu no. 11/2008 tentang informasi dan transaksi elektronik. <https://peraturan.bpk.go.id/Download/26676/UU%20Nomor%2019%20Tahun%202016.pdf>.
- [72] (2017) Timeline of instagram — threaded comments introduced. [Online]. Available: [https://en.wikipedia.org/wiki/Timeline\\_of\\_Instagram](https://en.wikipedia.org/wiki/Timeline_of_Instagram)
- [73] (2023) Instagram ranking explained. [Online]. Available: <https://about.instagram.com/blog/announcements/instagram-ranking-explained>
- [74] (2021) Shedding more light on how instagram works. [Online]. Available: <https://about.instagram.com/blog/announcements/shedding-more-light-on-how-instagram-works>



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[75]

(2016) Like facebook, instagram is about to go—gasp—algorithmic. [Online]. Available: <https://www.wired.com/2016/03/instagram-will-soon-show-thinks-want-see>