

Learning and Teaching Social Network Analysis with Artificial Intelligence, Generative AI, and Python in Google Colab

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Social Network Analysis (SNA) is a foundational analytical framework for understanding complex systems such as social media platforms, communication networks, collaboration structures, and information diffusion processes. Despite its broad applicability, teaching SNA effectively remains challenging because it relies on graph theory, algorithmic reasoning, and computational tools. This paper presents a practical, pedagogy-driven framework for learning and teaching Social Network Analysis using Python, Artificial Intelligence (AI), and Generative AI within the Google Colab environment. Grounded in the core concepts and algorithms presented in *Practical Social Network Analysis with Python*, the proposed approach integrates classical graph theory, network metrics, and graph algorithms with modern AI-assisted coding and conceptual scaffolding. Students engage in hands-on analysis of real-world and synthetic network datasets, implement foundational algorithms such as breadth-first search, PageRank, and community detection, and gain exposure to advanced topics including representation learning on graphs and signed networks. Generative AI tools are incorporated as instructional supports to aid code synthesis, debugging, data generation, and conceptual understanding. The framework offers a reproducible, accessible, and scalable instructional model for modern SNA education.

Keywords: Social Network Analysis; Graph Mining; Network Science Pedagogy; Artificial Intelligence; Generative AI; AI-Augmented Learning; Computational Social Science; Python; Google Colab