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Тернопільський національний технічний університет імені Івана Пулюя

SIMULATION TOOLS FOR NETWORK TECHNOLOGY RESEARCH

Науковий керівник: к.філол.н., доцент Боднар О.І.

Pryimachenko M.
Ternopil Ivan Puluj National Technical University

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Supervisor: PhD in Philology, Assoc. Prof. Bodnar O.I.

Key words: simulation, tools, networks

Modern network technologies are extremely complex, and their study and development require effective tools for research and experimentation. Simulation tools play a key role in this process by providing the ability to model, test, and analyze various aspects of network topologies, protocols, and services. They enable the creation of virtual environments that mimic real networks, allowing experimentation without risking impact on actual infrastructure. Thanks to these tools, users can develop, test, and refine network solutions, simplifying the process of learning network technologies and enhancing the efficiency of network specialists.

Mininet is a network emulation tool that enables the creation of virtual network topologies in the Software-Defined Networking (SDN) environment. Based on Linux containers, it allows users to create complex network models, experiment with different routing protocols and algorithms, and test automation and programming solutions. Mininet is a popular tool in the field of network technology research and education as it enables the replication of complex network scenarios in a virtual environment with minimal resource costs.

Cisco Packet Tracer is an interactive network modeling tool developed by Cisco Systems. It provides the ability to create virtual network topologies, configure network devices (such as routers, switches, firewalls, etc.), test network configurations, and experiment with various network technologies. Cisco Packet Tracer is widely used as an educational tool for learning network technologies and Cisco products, as well as for developing and debugging network solutions.

NetSim is network simulation software developed by Tetcos. It allows users to create virtual network topologies, explore various network protocols, perform simulations, and evaluate network performance. NetSim is used as a tool for education, research, and network design, as well as for testing various network scenarios.

In the table, we provide a comparative analysis of three different software tools for network modeling. For each of these tools, we analyze various characteristics. This helps to determine the advantages and limitations of each tool compared to others.

The conclusion from the table makes it possible to understand that each of the tools has its strengths and weaknesses, and the choice between them depends on the specific needs of the user. Therefore, students and teachers of network technologies may benefit from using

Cisco Packet Tracer. Mininet is recommended for SDN research, and for more general analysis and research of network protocols, NetSim can be an excellent choice.

Table 1
Comparative analysis of network modeling tools

Criterion	Packet Tracer	Mininet	NetSim
Overview of Tools	Good	Good	Good
Supported Hardware and Technologies	Cisco-specific	Varied	Wide Range
Network Topology Modeling	Good	Good	Good
Programming and Automation	Limited	Good	Good
Usage in Education and Research	Good	Good	Good

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Тернопільський національний технічний університет імені Івана Пулюя

РОЗРОБКА БРАУЗЕРНОГО РОЗШИРЕННЯ ДЛЯ ГЕНЕРАЦІЇ ЕМЕЙЛІВ З ДОПОМОГОЮ ШТУЧНОГО ІНТЕЛЕКТУ

Науковий керівник: д.т.н., професор Приймак М. В.

Rokosh M.
Ternopil Ivan Puluj National Technical University

DEVELOPING A BROWSER EXTENSION FOR EMAIL GENERATION WITH THE HELP OF ARTIFICIAL INTELLIGENCE

Supervisor: Doctor of Technical Sciences, Professor M. V. Pryimak.

Ключові слова: генеративний штучний інтелект, браузерне розширення, email-комунікація.
Keywords: generative artificial intelligence, browser extension, email communication.

Modern technologies of generative artificial intelligence (GAI) open up new possibilities for automating various processes, including business correspondence. GAI is capable of creating new content, adapting it to specific contexts and user requirements, which can significantly enhance the efficiency of work processes.

To explore the possibilities of implementing GAI in business processes, a new software product, EmoGPT, was created. The program is implemented as a Chrome browser extension and provides users with tools for automated generation of responses to emails in Gmail. A distinctive feature of EmoGPT is not only text generation but also the analysis of