



MAGAZINE

ISSUENO: 151

Feb 9 ,2024

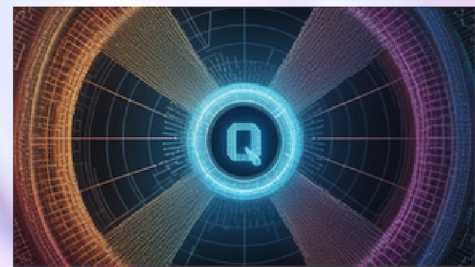
Byte Quest

Department of

CSE



DATA COMPUTING



QUANTUM-RESISTANT CRYPTOGRAPHY



STABLE DIFFUSION 2



BIOINSPIRED ROBOTICS

Department Vision

To be a center for academic excellence in the field of Computer Science and Engineering education to enable graduates to be ethical and competent professionals.

FACULTY COORDINATORS

P.Bhargavi
(ASSOCIATE
PROFESSOR)
K.Sri Vidya
(ASST. PROFESSOR)

Department Mission

To enable students to develop logic and problem solving approach that will help build their careers in the innovative field of computing and provide creative solutions for the benefit of society.

STUDENT COORDINATORS

AMAN (3/4) CSE B
VIJAY (3/4) CSE B



Byte Quest

DATA COMPUTING

Data computing, refers to the processing, storage, and manipulation of digital data. It involves the use of computer systems and software to manage, analyze, and derive insights from large volumes of data. Data exists in various states, including data at rest, data in transit, and data in use.

It is represented using the binary number system of ones and zeros, and it requires interpretation to become information

Storage and Transmission: Data representing quantities, characters, or symbols on which operations are performed by a computer are stored and recorded on various media such as magnetic, optical, electronic, or mechanical recording media. Additionally, data can be transmitted in the form of digital electrical or optical signals

Big Data Processing: Big data processing places heavy demands on the underlying compute infrastructure, often provided by clustered systems that distribute processing workloads across hundreds or thousands of commodity servers, using technologies like Hadoop and the Spark processing engine

Relational Databases: Digital data are often stored in relational databases, such as tables or SQL databases, and can generally be represented as abstract key/value pairs



QUANTUM-RESISTANT CRYPTOGRAPHY

Quantum-resistant cryptography is a critical area of research and development in response to the potential threat posed by quantum computers to current encryption algorithms. Quantum computers, when powerful enough, could theoretically break the encryption algorithms that currently secure digital information. As a result, efforts are underway to develop new cryptographic algorithms that are resistant to even the most powerful quantum computers



Importance and Applications: The development of quantum-resistant cryptography is crucial for various sectors, including government, healthcare, and cybersecurity. The Department of Defense is concerned about employing quantum-resistant cryptography today to protect classified information that will still be classified in the future.

Current Implementations: Google introduced a quantum-resistant hybrid cryptography mechanism in Chrome 116, which encrypts TLS connections. Additionally, Google released its first quantum-resilient FIDO2 key implementation, which uses a unique ECC/Dilithium hybrid signature schema co-created with ETH Zurich. Dilithium is a quantum-resistant cryptographic standard acclaimed for its security and performance



Byte Quest

STABLE DIFFUSION 2

Stable Diffusion 2 is a text-to-image latent diffusion model built upon the work of the original Stable Diffusion, and it was led by Robin Rombach and Katherine Crowson from Stability AI and LAION.

These models are trained on an aesthetic subset of the LAION-5B dataset created by the DeepFloyd team at Stability AI, which is then further filtered to remove adult content using LAION's NSFW filter.



Enhanced Image Realism and Accuracy: Stable Diffusion 2 brings improvements in generating more accurate text prompts and producing more realistic images compared to its predecessor. The text-to-image models in Stable Diffusion 2 are trained with a new text encoder (OpenCLIP) and are capable of outputting images in higher resolutions, such as 512x512 and 768x768.

community Reception: The release of Stable Diffusion 2 has sparked mixed reactions within the AI community. While it has been praised for its advancements, there have also been reports of apparently lower performance compared to Stable Diffusion 1 in certain cases

Components of Methodology:

- Approach Explanation: The methodology section explains the type of research chosen and the rationale behind the choice of methods .
- Instruments Used: It describes the tools and instruments used for data collection and how they were utilized. This can include surveys, questionnaires, interviews, observations, or a combination of methods .
- Data Analysis: The methodology explains how the collected data was processed and analyzed, without discussing the results or conclusions at this stage .
- Mixed Method: Some research may involve a combination of both qualitative and quantitative methods, providing a more comprehensive approach to findings

Usage and Integration: Stable Diffusion 2 can be integrated behind an API endpoint for easy deployment. It accepts text prompts describing the desired image and generates images that tend to improve with more descriptive words in the prompt

Overall, Stable Diffusion 2 represents a significant leap forward in AI models for text-to-image generation, offering advanced features and capabilities for image generation and modification based on textual input.



Byte Quest

BIOINSPIRED ROBOTICS

Bioinspired robotics involves the design and development of robots that draw inspiration from biological systems, such as animals and plants, to create machines with lifelike capabilities.

The biological systems have been optimized for specific tasks according to their habitat. However, they are multifunctional and are not designed for only one specific functionality.



Nature-Inspired Design: Bioinspired robotics aims to mimic the capabilities and functionalities observed in nature, allowing robots to interact with their environment in a more adaptive and responsive manner. This approach often leads to the creation of robots that can perform tasks more efficiently and effectively by emulating the mechanisms found in living organisms.

Research and Development: Academic institutions and research labs are actively engaged in bioinspired robotics research, focusing on areas such as:

- **Biomechanics:** Understanding the principles of motion and mechanics observed in biological systems to inform the design of robotic components.
- **Interdisciplinary Approach:** Integration of principles from biomechanics, numerical techniques, and basic robotics skills to develop innovative robotic systems.

Challenges and Future Directions: Despite significant progress, there are challenges in bridging the gap between bio-inspired robots and their biological counterparts.

In conclusion, bioinspired robotics leverages nature's design principles to create robots with enhanced adaptability, efficiency, and lifelike capabilities. This interdisciplinary field holds promise for revolutionizing various industries and advancing the development of robotic systems.

BROUGHT TO YOU BY



**Department of
Computer Science and Engineering
Vasavi College of Engineering**