

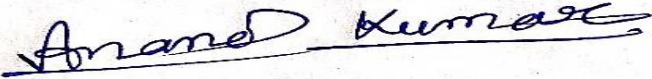
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INVENTION DISCLOSURE FORM

Details of Invention for better understanding:

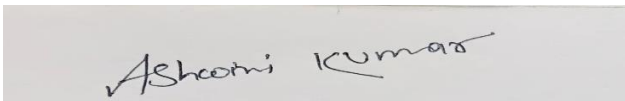
1. TITLE: NeuroLoom: Brainwave-to-Image AI System

2. INTERNAL INVENTOR(S)/ STUDENT(S): All fields in this column are mandatory to be filled

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DESCRIPTION OF THE INVENTION: NeuroLoom is a cool new system that turns your thoughts and emotions into beautiful digital art. Using a special headset, it reads your brain’s activity—like when you're relaxed, focused, or feeling creative—and turns that into unique, ever-changing artwork. You can even interact with the art, changing colors and styles in real time. It's a fun way to express yourself, relax, or explore your mind, and it could even be used in art therapy or public installations. NeuroLoom blends science, technology, and creativity to give you a whole new way to see what's happening in your mind.

PROBLEM ADDRESSED BY THE INVENTION

While brainwave technology and brain-computer interfaces (BCIs) have seen significant advancements, most EEG systems remain focused on medical and scientific applications. These traditional setups often present brain activity as intricate waveforms, heatmaps, and graphs that require expert analysis, leaving the average person feeling disconnected from this information.

Simultaneously, AI-generated art has surged in popularity, but it seldom interacts with real-time bio-signals like EEG data. Few platforms exist that allow individuals to influence digital art through their thoughts and emotions, limiting the creative potential of EEG technology as a means for self-expression and interactive experiences beyond clinical settings.

NeuroLoom addresses this gap by transforming raw EEG signals into captivating digital art. This innovative system analyzes various brainwave frequencies linked to mental states such as relaxation, focus, and excitement, translating them into dynamic visuals in real time. Users can see and engage with their brain activity in an intuitive and immersive way, making neuroscience accessible and personal, as well as a tool for creativity and therapy.

More than just a technological advancement, NeuroLoom serves as a conduit between neuroscience, artificial intelligence, and digital art. It opens the door for individuals from all walks of life to explore their cognitive and emotional realms, whether for personal wellness, mindfulness, therapy, or interactive art installations. With NeuroLoom, anyone can embark on a journey of self-discovery and creative expression, without needing any specialized knowledge.

OBJECTIVE OF THE INVENTION:

The primary objective of NeuroLoom is to develop an innovative system that translates real-time electroencephalography (EEG) data into dynamic and aesthetically engaging digital artwork. By leveraging advancements in neuroscience, signal processing, and artificial intelligence (AI), NeuroLoom aims to

bridge the gap between brainwave analysis and creative visual expression. This invention introduces a novel method for visualizing cognitive and emotional states, offering both personal and collective experiences of neuro-generated art.

Specific Objectives:

1. **Real-Time EEG Data Interpretation**
To create a system capable of acquiring, processing, and interpreting real-time EEG signals, accurately mapping brainwave activity to corresponding cognitive or emotional states.
2. **Generative Artistic Visualization**
To translate EEG-derived features into visually compelling digital artwork using AI techniques such as Generative Adversarial Networks (GANs) and Neural Style Transfer (NST).
3. **Interactive and Adaptive User Experience**
To offer users a customizable and interactive interface that allows them to control artistic styles, adjust visual parameters, and engage with their brain-generated art in real-time.
4. **Enhancement of Mental Well-being through Neuroaesthetics**
To promote mental wellness and mindfulness by providing users with a therapeutic platform where they can visualize and reflect upon their mental states in an artistic and immersive manner.
5. **Scalable and Flexible System Architecture**
To design a modular and scalable system architecture compatible with various EEG hardware and capable of supporting different output formats, including virtual reality (VR), augmented reality (AR), and large-scale interactive installations.
6. **Exploration of Cognitive-Driven Creative Expression**
To expand the boundaries of traditional digital art by introducing a system where human cognition directly influences artistic output, fostering a deeper connection between the mind and creative expression

A. STATE OF THE ART/ RESEARCH GAP/NOVELTY: Describe your invention fulfil the research gap?

Sr. No.	Patent ID	Abstract	Research Gap	Novelty
1.	US20150310688A1	Brain-Computer Interface (BCI) systems using EEG for device control and neurofeedback.	Focused on control and diagnostic applications, lacking artistic visualizations.	NeuroLoom uniquely translates EEG data into personalized generative art in real-time.
2.	US20170249958A1	EEG-based systems for neurofeedback and meditation tools.	Provides feedback via graphs and indicators but not artistic experiences.	NeuroLoom combines real-time EEG with AI-powered generative art for neuroaesthetic applications.

3.	US20200312632A1	EEG signal acquisition and analysis for clinical purposes.	Emphasizes diagnostics without creative expression or immersive interaction.	NeuroLoom leverages EEG data for creative, therapeutic, and immersive digital experiences.
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B. DETAILED DESCRIPTION:

NeuroLoom: Turning Brainwaves into Living Art

1. What is NeuroLoom?

NeuroLoom is a groundbreaking system that transforms real-time brain activity into dynamic, ever-evolving digital art. It combines electroencephalography (EEG), artificial intelligence (AI), and creative design to give users a unique way to experience and visualize their thoughts and emotions. By capturing brainwave signals, interpreting them, and translating them into stunning artwork, NeuroLoom creates a seamless bridge between neuroscience and artistic expression.

2. How It Works

NeuroLoom is built around three main components:

EEG Data Acquisition – A headset that captures brainwave activity.

Signal Processing & Cognitive Analysis – AI algorithms that interpret mental states.

AI-Driven Art Generation – A system that turns those mental states into digital visuals.

These components work together to produce personalized artwork that reacts in real-time to the user's cognitive and emotional state.

3. Capturing Brainwave Signals

At the heart of NeuroLoom is its EEG data acquisition module, which collects real-time electrical activity from the brain. Using high-tech EEG headsets like OpenBCI, Muse, or Emotiv, it detects different brainwave frequencies—delta, theta, alpha, beta, and gamma—which correspond to relaxation, focus, creativity, and more. These signals are wirelessly transmitted to the processing unit for deeper analysis.

4. Making Sense of Brain Activity

Once the EEG data is captured, it needs to be cleaned up. Since muscle movement, blinking, and external noise can interfere with the signals, NeuroLoom applies digital filtering and artifact rejection algorithms to remove unwanted distortions. Advanced techniques like Fast Fourier Transform (FFT), Wavelet Transform, and Power Spectral Density (PSD) then break down the signals into meaningful patterns. These patterns help determine if the user is in a state of deep relaxation, intense focus, or heightened excitement.

5. Understanding the Mind with AI

The system doesn't just collect brainwave data—it learns from it. Using machine learning algorithms like Support Vector Machines (SVM), k-Nearest Neighbors (k-NN), and Deep Neural Networks (DNN), NeuroLoom identifies patterns in the data and classifies mental states in real-time. This classification becomes the foundation for generating artwork that visually represents the user's thoughts and emotions.

6. Creating Art from Brainwaves

Once the system understands the user's mental state, the AI-driven art engine gets to work. It translates the classified brainwave data into visual elements like:

Color palettes (calming blues for relaxation, energetic reds for focus)

Brushstroke styles (soft and fluid for meditation, sharp and dynamic for high energy)

Animation speed (slow, smooth transitions for calm states, rapid motion for excitement)

NeuroLoom uses advanced AI techniques, including Generative Adversarial Networks (GANs) and Neural Style Transfer (NST), to create digital art that continuously evolves based on brain activity.

7. A Personalized Artistic Experience

Users have full control over their artistic journey. NeuroLoom's user-friendly interface allows them to:

1. Choose from different artistic themes and styles.
2. Adjust settings for relaxation, meditation, or creativity enhancement.
3. View real-time feedback on their brainwave activity alongside their generated artwork.

This makes the experience both interactive and deeply personal.

8. Where Can You Experience NeuroLoom?

NeuroLoom's digital art can be displayed in various ways:

1. Monitors & LED walls – Ideal for home use or exhibitions.
2. Virtual Reality (VR) & Augmented Reality (AR) – Users can step inside immersive, brainwave-controlled environments.
3. 3D Displays & Interactive Installations – Great for live performances and public art spaces.

With VR and AR modes, users can explore landscapes that react to their mental state, making the experience feel like stepping inside their own mind.

9. Who Can Benefit from NeuroLoom?

NeuroLoom has wide-ranging applications across multiple fields:

1. Digital Art – Artists can create unique, brainwave-driven pieces.
2. Wellness & Mental Health – Users can visualize and regulate their emotions through interactive meditation.
3. Education & Neuroscience – A hands-on way to learn about brain activity.
4. Live Performances & Installations – Audiences can experience collective, interactive neuro-art.

10. What's Next for NeuroLoom?

The future of NeuroLoom is limitless. Planned developments include:

1. Smarter AI Models – More advanced emotional recognition and personalized artistic output.
2. Enhanced VR & AR – Multi-sensory environments for deeper immersion.
3. Multi-User Collaboration – Combining brainwave data from multiple users to create shared artwork.
4. Large-Scale Installations – Public exhibits where crowds influence visual displays with their collective neural activity.

C. RESULTS AND ADVANTAGES:

1. Real-Time Translation of Brain Activity into Art

One of the primary results of NeuroLoom is its ability to capture real-time EEG signals and translate them into continuously evolving digital artwork. This immediate transformation offers users a direct, immersive reflection of their cognitive and emotional states. Unlike traditional EEG visualization tools, which are primarily analytical and static, NeuroLoom creates dynamic, artistic expressions that respond to real-time fluctuations in brainwave activity. This capability fosters a more intuitive and engaging experience for users, who can see their mental states manifested as living art.

2. Enhanced User Engagement through Interactive Visual Feedback

NeuroLoom significantly enhances user engagement by offering an interactive platform where individuals can observe and influence the visual output based on their mental state. By enabling customization of artistic styles, color schemes, and animation parameters, the system empowers users to personalize their experience. This adaptability leads to a deeper connection between the user and the system, increasing user satisfaction and promoting repeated use. The real-time visual feedback encourages users to explore different cognitive and emotional states, fostering self-awareness and mindfulness.

3. Therapeutic and Wellness Applications

An important advantage of NeuroLoom is its potential use as a tool for mental health and well-being. By providing a visual representation of cognitive and emotional states, the system supports mindfulness practices, relaxation techniques, and stress reduction exercises. Neuroaesthetic studies suggest that viewing and creating art can have therapeutic benefits, and NeuroLoom leverages this principle by allowing users to engage with personalized neuro-generated art. This makes it a valuable tool for individuals seeking alternative methods to manage stress, anxiety, and emotional regulation.

4. Expanding the Boundaries of Digital Art and Creative Expression

NeuroLoom offers a novel medium for artists, designers, and performers by transforming brainwave data into artistic visuals. This creates new opportunities for cognitive-driven creative expression, where the human mind directly influences the generative art process. The system can be integrated into live performances, exhibitions, and interactive installations, allowing audiences to experience art that is dynamically shaped by the artist's or participants' mental states. This innovation expands the boundaries of digital art, promoting interdisciplinary collaboration between neuroscience, technology, and the arts.

5. Modular, Scalable, and Hardware-Agnostic Architecture

The modular and scalable design of NeuroLoom ensures compatibility with a wide range of EEG hardware, display technologies, and computing platforms. The system can be adapted for various use cases, including personal applications, VR/AR experiences, and large-scale installations. Its hardware-agnostic approach enables seamless integration with commercially available EEG headsets, while the software can be customized and expanded with additional AI models and sensory feedback systems. This flexibility makes NeuroLoom suitable for a broad spectrum of applications and user groups.

6. Educational and Research Value

NeuroLoom provides significant educational value by making complex neurological concepts more accessible through visual representation. Educators and researchers can use the system to demonstrate brainwave patterns, cognitive processes, and neurofeedback in an intuitive and engaging manner. By visualizing brain activity in real-time, NeuroLoom facilitates a better understanding of neuroscience for students, professionals, and the general public, making it a valuable tool in both academic and outreach settings.

7. Promotion of Self-Awareness and Cognitive Training

Through continuous feedback and visualization, NeuroLoom encourages users to become more aware of their mental states and how they change over time. The system can be used as a cognitive training tool, helping individuals learn to modulate their brain activity through practices such as meditation, focus enhancement, and stress management. This promotes greater self-awareness, cognitive control, and emotional intelligence, offering long-term benefits for personal development.

8. Potential for Multi-User and Collaborative Experiences

NeuroLoom's architecture allows for future expansion into multi-user scenarios, where brainwave data from multiple individuals can be combined to create collaborative digital art. This feature offers potential applications in social, therapeutic, and entertainment contexts, fostering collective experiences that highlight group dynamics and shared cognitive states. Collaborative neuro-generated art can be displayed in public installations, festivals, and performances, offering an innovative form of interactive media.

D. EXPANSION:

The Future of NeuroLoom: Expanding the Boundaries of Brainwave-Generated Art

NeuroLoom is more than just an innovative way to visualize brain activity—it's a platform with limitless potential. As the technology evolves, exciting new features and applications will take this system to the next level. Here's a look at what's coming next for NeuroLoom.

1. Stepping into Virtual and Augmented Reality

Imagine walking through a virtual world shaped by your thoughts or seeing your emotions projected as dynamic art in your living space. NeuroLoom's integration with Virtual Reality (VR) and Augmented Reality (AR) will make this possible. In VR, users will be able to navigate immersive 3D landscapes that shift and transform based on their brain activity, enhancing relaxation, meditation, or creative exploration. AR applications, on the other hand, will overlay brainwave-generated art onto real-world environments, letting users interact with their surroundings in an entirely new way. This opens doors for digital therapy, mindfulness experiences, and interactive entertainment.

2. Multi-User & Collaborative Experiences

Future versions of NeuroLoom will allow multiple users to connect simultaneously, combining their brainwave data to generate shared digital art. This feature will be perfect for live performances, interactive exhibitions, and group therapy sessions. Whether it's a team of artists co-creating a piece in real time, or a meditation group visualizing their collective calm, this technology will enable a whole new form of social neuro-art.

3. Smarter AI for Personalized Experiences

NeuroLoom's AI models will become more adaptive and personalized, learning from individual users over time. By analyzing historical EEG data and personal preferences, the system will fine-tune the generated artwork to better reflect subtle changes in emotional and cognitive states. This means:

1. More accurate, personalized visuals that truly represent the user's mind.
2. AI-driven mental wellness insights, such as detecting stress patterns and suggesting relaxing artistic themes.
3. A more engaging experience, as the system evolves with the user's neural patterns.

4. Beyond EEG: A Full-Body Neurofeedback System

Why stop at brainwaves? NeuroLoom can become even more immersive by integrating additional biometric sensors that track:

1. Heart rate variability (to detect stress and relaxation).
2. Skin conductance (to measure emotional arousal).
3. Respiration and muscle activity (to add physical state awareness).

With this data, the system could generate even richer and more nuanced artwork, offering a complete picture of both mental and physical well-being. This expansion will make NeuroLoom a powerful tool for stress management, biofeedback therapy, and cognitive training.

5. Large-Scale Public Installations & Exhibitions

NeuroLoom's potential extends beyond personal use—it can transform public spaces into interactive neuro-art experiences. Imagine an art installation in a museum or festival where participants can see their brain activity projected onto massive LED screens or immersive projection-mapped environments. These installations will not only foster curiosity about neuroscience but also turn brainwave data into a collective artistic experience that connects people in an entirely new way.

6. Applications in Therapy & Mental Health

NeuroLoom could become a valuable tool for neurofeedback therapy, helping individuals train their brains to manage conditions like:

1. Anxiety – Using calming visual feedback to encourage relaxation.
2. ADHD – Reinforcing focus through engaging, real-time brainwave visualization.
3. PTSD – Creating safe, therapeutic environments that adapt to emotional states.

By making neurofeedback more visually engaging, NeuroLoom can help patients build emotional resilience and gain better control over their mental states.

7. A Next-Generation Educational Tool

NeuroLoom has huge potential in education, helping students and researchers understand brain activity in real time. Possible uses include:

1. Interactive neuroscience lessons, where students can see their brainwaves while solving problems or meditating.
2. Cognitive training programs, helping users improve focus, relaxation, or emotional regulation.
3. Educational experiments, where learners can explore how different mental states influence neural activity.

By turning brain science into a visual and interactive experience, NeuroLoom makes learning about the mind more engaging and accessible.

8. Multisensory Integration: Feel & Hear Your Thoughts

To enhance immersion, NeuroLoom could integrate haptic feedback and soundscapes. Imagine feeling gentle vibrations that correspond to your mental state or hearing adaptive music that shifts with your brain activity. This multisensory approach would create a deeply engaging experience, making NeuroLoom even more powerful for:

1. Meditation and relaxation – Synchronizing visuals, sound, and touch for deeper immersion.
2. Therapy and rehabilitation – Using multisensory feedback to improve cognitive and emotional well-being.
3. VR applications – Making virtual brainwave worlds feel even more real.

9. Consumer-Friendly Devices & Mobile Integration

To make NeuroLoom accessible to everyday users, future versions will integrate with portable EEG headsets and mobile apps. This means users could:

1. Generate personalized neuro-art on their phone for relaxation or creativity.
2. Use a lightweight, wearable EEG device instead of a full headset.
3. Subscribe to digital art experiences tailored to their mood and mental state.

By bringing NeuroLoom into the consumer wellness and entertainment markets, it can reach a wider audience and become a staple in daily mental health routines.

Final Thoughts

NeuroLoom is just getting started. From VR worlds shaped by your mind to public neuro-art installations, the possibilities for expansion are endless. As the technology evolves, it will continue to redefine how we understand, visualize, and interact with our own consciousness. Whether for art, wellness, education, or therapy, NeuroLoom is set to become a revolutionary tool that bridges neuroscience and creativity like never before.

E. WORKING PROTOTYPE/ FORMULATION/ DESIGN/COMPOSITION:

The following is the flow chart depicting the brief of the system:

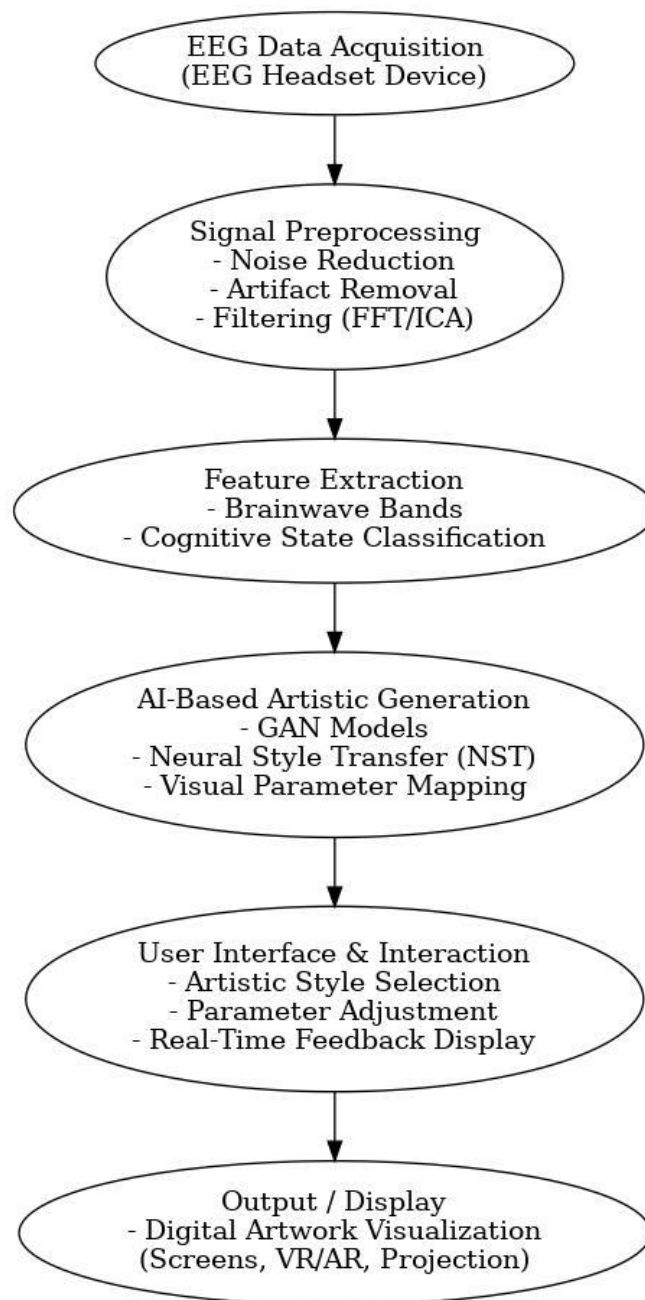


Figure1. NeuroLoom System Architecture: EEG-to-Art Process Flow

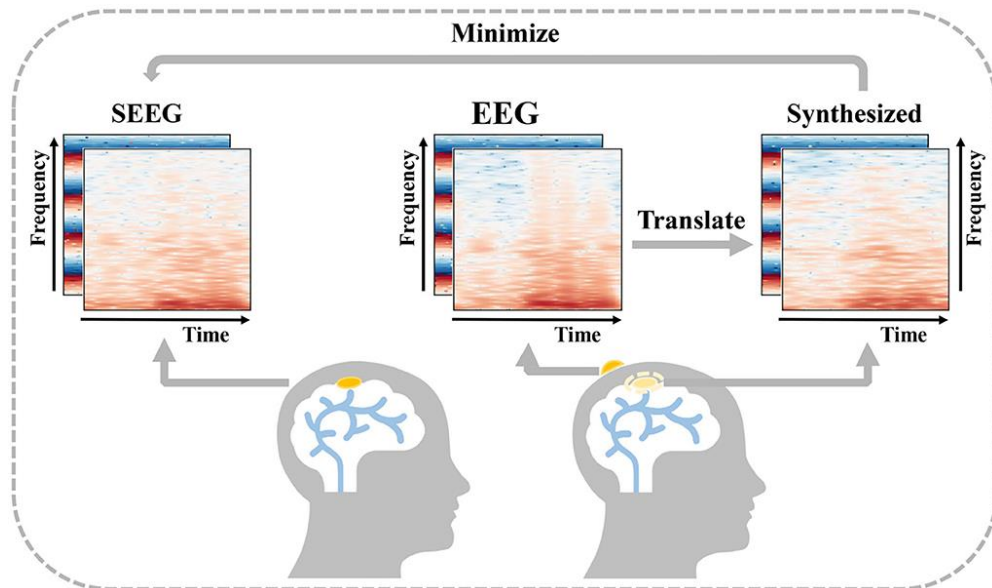


Figure 2. EEG-to-Stereoelectroencephalography (SEEG) translation

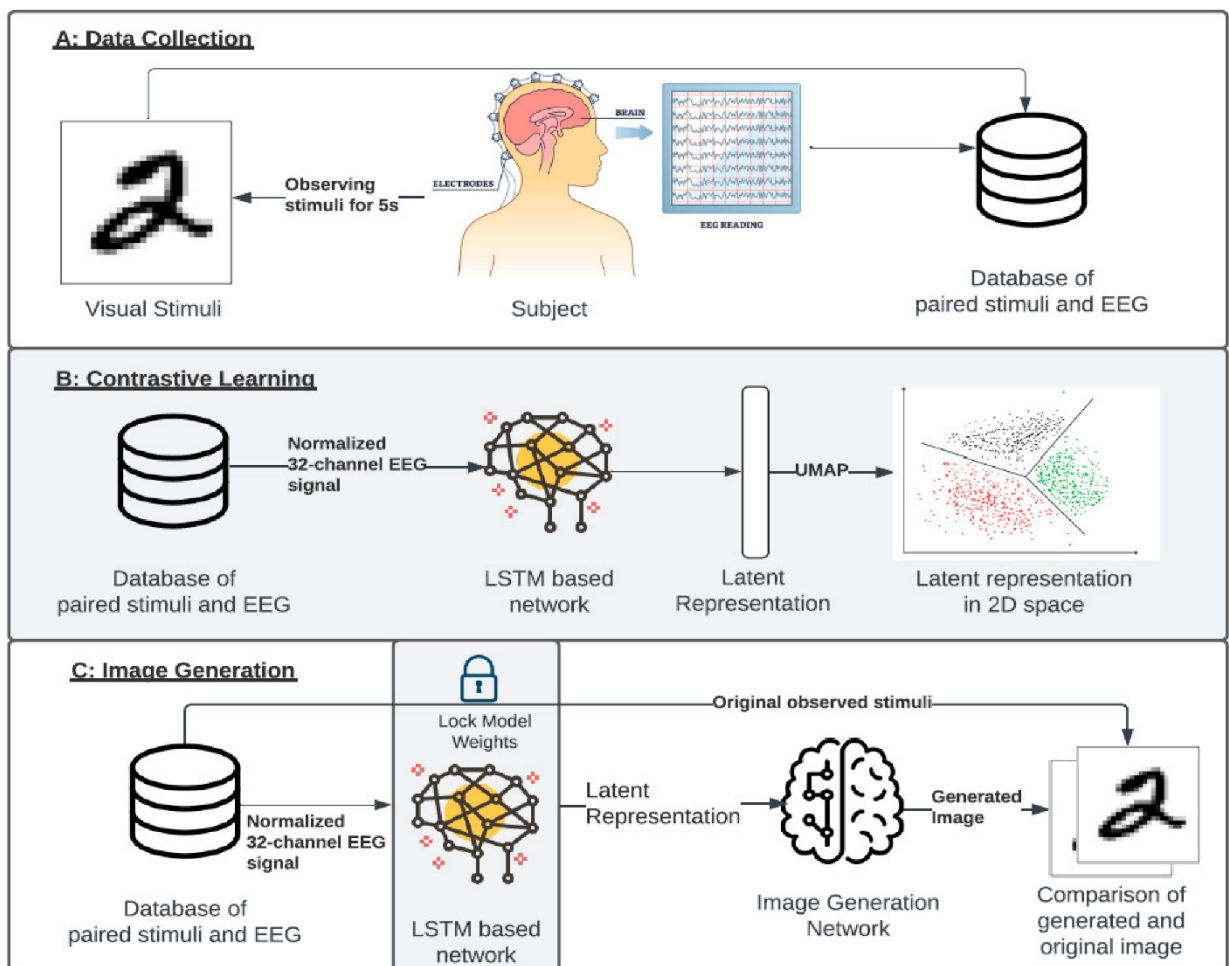


Figure 3. Study overview. Figure showing the study overview. (A) Data collection: EEG Data was collected while subjects observed the stimuli (image). Paired stimuli (image) and EEG data for each subject were stored in a database for further analysis. (B) Each sample contained 32 channels, which were normalized based on the subjects' baseline measurements (closed eyes). The data was then fed into an LSTM-based network while employing contrastive loss. This resulted in a latent representation of the EEG signal. (C) Extracted latent representations served as input for an image generator, generating images for comparison against the original stimuli (ground truth image).

Figure 4. Visualization of attribution scores. **(A)** Line plot showing average attribution scores across timesteps in EEG data. **(B)** Heatmap showing average attribution of for each EEG channel and each stimuli type (images of handwritten numbers from 0 to 9).

F. EXISTING DATA:

The **NeuroLoom** system's design, functionality, and applications may be expanded and adapted through the variation of several key parameters, components, and techniques. These variables allow for scalability, customization, and broad applicability of the invention across different domains, user requirements, and technological platforms.

1. EEG Hardware Variability

1. **Type of EEG Device:** The system can be used with a variety of EEG headsets, including:
 - o Low-channel consumer devices (e.g., Muse, Emotiv Insight)
 - o High-channel research-grade devices (e.g., OpenBCI, NeuroSky, g.tec)
2. **Number of Electrodes:** NeuroLoom can adapt to devices with 4 to 64+ electrodes, affecting the resolution and detail of brainwave data.
3. **Sensor Placement:** Variable positioning (10-20 system, customized montages) influences which cognitive/emotional states are captured and mapped.

2. Brainwave Frequency Ranges

1. The system can be expanded to process and visualize a broader spectrum of brainwave frequencies:

Delta (0.5–4 Hz)

Theta (4–8 Hz)

Alpha (8–14 Hz)

Beta (14–30 Hz)

Gamma (30–100 Hz or higher)

3. Signal Processing Algorithms

1. Multiple preprocessing techniques may be implemented, including:
 - a. Fast Fourier Transform (FFT)
 - b. Wavelet Transform (WT)
 - c. Independent Component Analysis (ICA)
 - d. Empirical Mode Decomposition (EMD)
2. Artifact rejection algorithms may vary, offering modular preprocessing pipelines.

4. Machine Learning and AI Models

1. The AI engine can incorporate:
 - a. Generative Adversarial Networks (GANs)
 - b. Neural Style Transfer (NST)
 - c. Variational Autoencoders (VAEs)
 - d. Diffusion Models

2. Expansion to adaptive learning algorithms, where AI models evolve and personalize based on user data over time.

5. Visual Output Modalities

1. NeuroLoom-generated visuals can be displayed through:
 - a) Traditional 2D displays (monitors, tablets)
 - b) Immersive Virtual Reality (VR) headsets
 - c) Augmented Reality (AR) overlays
 - d) Large-scale projection mapping installations
 - e) Physical mediums like 3D printing or light sculptures, mapping EEG data into tangible art.

6. User Control and Customization

- a) Variables that enable user interaction include:
- b) Choice of artistic styles (e.g., abstract, impressionist, surrealistic)
- c) Adjustment of color palettes, brush stroke simulation, and animation speed
- d) Real-time vs. time-lapse rendering modes
- e) Future developments may incorporate biofeedback loops, where the visual output influences user brain activity in real time.

7. Application Domains

- a) Expansion into various fields, including:
- b) Mental health therapy** (e.g., neurofeedback for relaxation)
- c) Mindfulness and meditation tools**
- d) Interactive art installations and exhibitions**
- e) Gaming and entertainment**
- f) Education and neuroscience research**
- g) Medical diagnostics support, where brainwave patterns are translated into intuitive visuals for clinician analysis.

8. Data Privacy and Security

- a) Variables to ensure user data privacy, including:
- b) Local vs. cloud-based processing options
- c) Anonymization protocols for EEG data sharing
- d) Compliance with healthcare standards (GDPR, HIPAA if applied to medical contexts)

G. WORKING PROTOTYPE / FORMULATION / DESIGN / COMPOSITION

At present, the working prototype of *NeuroLoom* is in development, with core modules (EEG data acquisition and signal processing) already functional in a simulated environment. The AI-driven artistic generation module has been tested separately using sample EEG datasets.

Current Status:

1. **EEG Hardware Integration:** Ready (tested with OpenBCI and Muse headsets)

2. **Signal Processing Pipeline:** Ready (basic filtering and feature extraction complete)
3. **AI Art Generation Engine:** Prototype tested (GAN and NST models in place)
4. **User Interface (UI):** Under development (basic dashboard functional)

Timeframe for Complete Prototype:

1. Estimated 6 to 8 weeks to finalize integration, optimize real-time processing, and complete UI/UX design for the working prototype.

F. EXISTING DATA:

1. Clinical EEG Data (Supporting Feasibility)

1. EEG-Based Cognitive State Detection:

- a) Numerous clinical studies have established reliable EEG markers for cognitive states such as relaxation (alpha waves), concentration (beta waves), and meditative states (theta waves).
- b) *Comparative:* Clinical EEG monitoring for attention and meditation apps (e.g., Muse, Emotiv) demonstrate effective real-time brainwave interpretation.

2. Artifact Removal and Signal Clarity:

- a) Signal processing methods (FFT, ICA, Wavelet Transform) used in NeuroLoom are based on established clinical practices for artifact reduction in EEG analysis.

2. AI Generative Art Comparisons

1. Existing AI Art Generators:

- a) Tools like DeepArt and RunwayML successfully use Neural Style Transfer (NST) and GANs to convert data into artistic visuals.
- b) *Comparative:* NeuroLoom integrates real-time physiological data (EEG), which differs from static image-based inputs typically used in existing AI art platforms.

3. Neuroaesthetic and Psychological Studies

1. Art and Mental Health Correlation:

- a) Studies show visual art therapy and exposure to dynamic art can improve mental well-being, reduce stress, and enhance emotional self-awareness.
- b) *Comparative:* NeuroLoom uniquely provides personalized, biofeedback-driven art based on an individual's neural state, expanding upon existing therapeutic methods.

4. Brain-Computer Interface (BCI) Systems

1. BCI Comparative Systems:

- a) Existing BCI platforms (e.g., OpenBCI, MindWave) offer real-time EEG processing for control and feedback applications.
- b) *Comparative:* NeuroLoom differs by focusing on artistic visualization rather than functional control, offering a novel creative BCI experience.

3. USE AND DISCLOSURE (IMPORTANT): Please answer the following questions:

A. Have you described or shown your invention/ design to anyone or in any conference?	YES ()	NO (✓)
B. Have you made any attempts to commercialize your invention (for example, have you approached any companies about purchasing or manufacturing your invention)?	YES ()	NO (✓)
C. Has your invention been described in any printed publication, or any other form of media, such as the Internet?	YES ()	NO (✓)
D. Do you have any collaboration with any other institute or organization on the same? Provide name and other details.	YES ()	NO (✓)
E. Name of Regulatory body or any other approvals if required.	YES ()	NO (✓)

4. Provide links and dates for such actions if the information has been made public (Google, research papers, YouTube videos, etc.) before sharing with us. NA

5. Provide the terms and conditions of the MOU also if the work is done in collaboration within or outside university (Any Industry, other Universities, or any other entity). NA

6. Potential Chances of Commercialization.

1. Book Writers and Publishers:

The system offers a completely new way for authors and publishers to analyze content for different aspects of narrative structure, readability, and more broadly to assess the appropriateness of the content. The value for publishers is knowing whether a manuscript meets market expectations as well as the needs of their target reader demographic; this will improve marketability and reduce editor rework costs.

2. Book-Level Evaluation:

The analyzer has the ability to evaluate the entire manuscript or the entirety of a book chapter for whether or not the content will resonate with a particular audience. This function is especially helpful for publishers and editors when assessing how their target audience might respond to a book prior to publishing.

3. Public Speakers:

The analyzer can also be beneficial for public speakers and trainers to refine speeches and presentations. A speaker can simulate what an audience will respond to by analyzing audience feedback and measuring cognitive load based on the content, then revising content for maximum clarity for a speaker. The objective is to communicate for maximum impact that will resonate across an audience segment.

4. Students for refining academic writings:

As educational institutions placed more significance on a skill like effective communication, the tool has provided students with an invaluable resource. It prepares students for academic writing and presentations, allowing them to learn to create clarity and engagement in their work.

5. **Corporate and Professional Communications:**

In addition to the academic and publishing domains, the tool can also be marketed to organizations in the corporate sector that want to improve their internal and external communication. Corporations can use the analyzer to assess their reports, presentations, and marketing communications to ensure that they are clear and engaging for their intended audience. When clear and engaging communication is employed, employees and customers will be able to improve communication effectiveness.

6. **Integration with Online Learning Platforms:**

The system has significant potential for inclusion into digital education systems by providing real-time feedback about students' writing assignments and presentations. Incorporating this system into online platforms can assist in elevating the quality of education content and therefore, improve student outcomes.

7. **Professors to assess the effectiveness of their lectures:**

Instructors can utilize the system to evaluate how effective their lecture content and writing materials are. By assessing the cognitive load as well as simulating the response of students while using their instructional material, professors can work toward modifying their instructional delivery to improve understanding and clarification in communicating of complex concepts.

7. **List of companies which can be contacted for commercialization along with the website link.**

Company	Domain	Website
Muse	EEG Headsets & Meditation Tools	chooseemuse.com
Emotiv	EEG Headsets & Cognitive Analytics	emotiv.com
Neurable	Brain-Computer Interfaces for VR/AR	neurable.com
OpenBCI	Open-source EEG Hardware	openbci.com
MindMaze	Neurotechnology for Healthcare & Gaming	mindmaze.com
RunwayML	AI Generative Art & Content Creation	runwayml.com

8. **Any basic patent which has been used and we need to pay royalty to them. NA**

9. **FILING OPTIONS:** Please indicate the level of your work which can be considered for provisional/ complete/ PCT filings **(Complete)**

10. **KEYWORDS:** Please provide right keywords for searching your invention.

- I. Brainwave-to-image technology
- II. Brain-computer interface (BCI)
- III. EEG signal processing
- IV. Neurotechnology
- V. Artificial intelligence for brainwaves
- VI. Neuroimaging AI
- VII. EEG-based image generation
- VIII. Neural interface for visual output
- IX. Cognitive state visualization
- X. Mind-controlled imaging system
- XI. Real-time brainwave interpretation
- XII. EEG-to-image neural networks
- XIII. Brainwave-based creativity tools
- XIV. Brain-to-art technology
- XV. Neurofeedback-driven art generation
- XVI. NeuroLoom
- XVII. Cognitive pattern recognition
- XVIII. Electroencephalogram (EEG) data analysis
- XIX. Deep learning for brainwave data
- XX. Binaural EEG modulation

NO OBJECTION CERTIFICATE

This is to certify that University/Organization Name or its associates shall have no objection if Lovely Professional University files an IPR (Patent/Copyright/Design/any other.....) entitled "....." including the name(s) of,..... as inventors who is(are) student(s)/employee(s) studying/ working in our University/ organization.

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