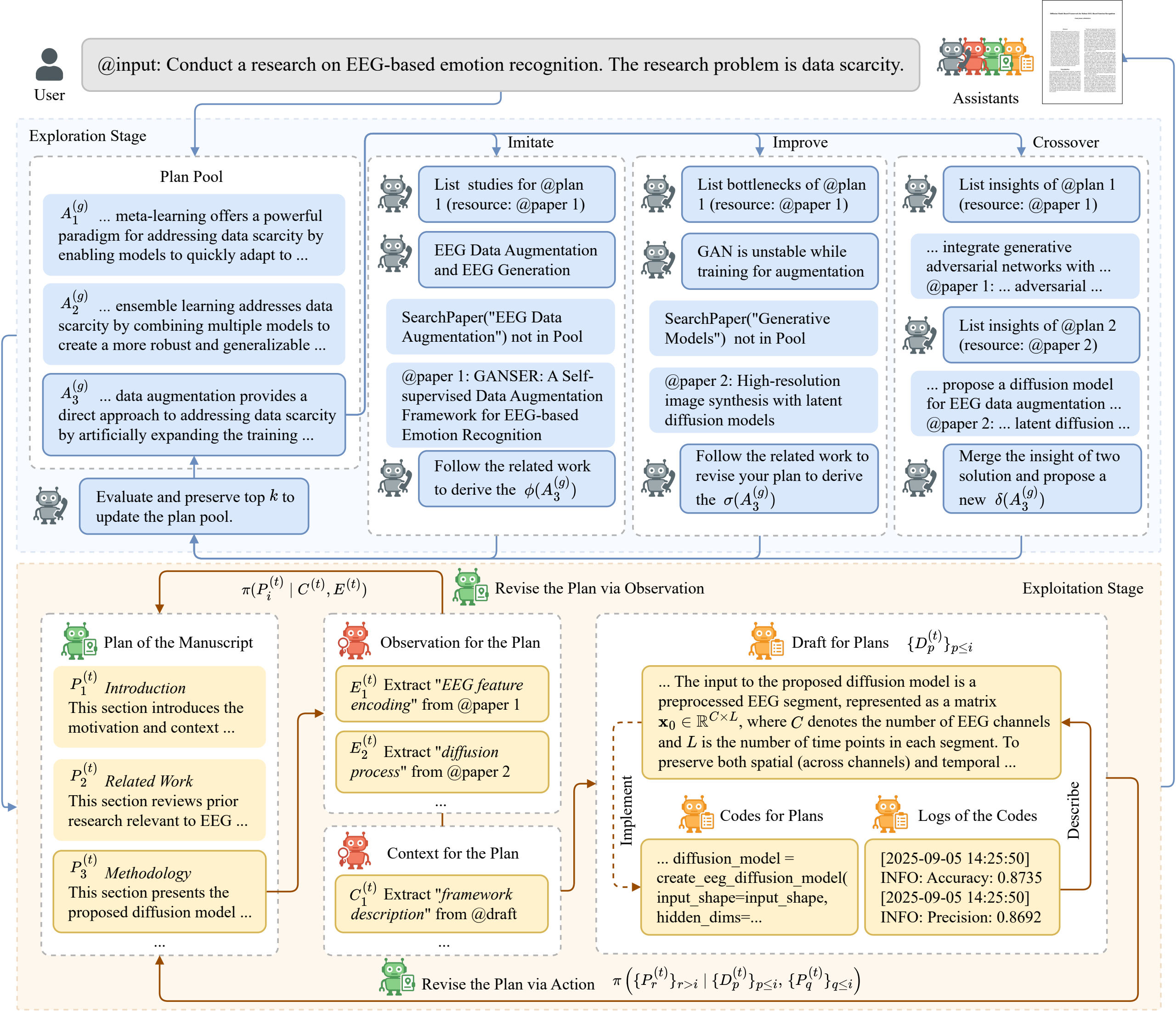

User
@input: Conduct a research on EEG-based emotion recognition. The research problem is data scarcity.
Assistants
Exploration Stage
Imitate
Improve
Crossover
Plan Pool
$A_1^{(g)}$ ... meta-learning offers a powerful paradigm for addressing data scarcity by enabling models to quickly adapt to ...
$A_2^{(g)}$ ... ensemble learning addresses data scarcity by combining multiple models to create a more robust and generalizable ...
$A_3^{(g)}$ ... data augmentation provides a direct approach to addressing data scarcity by artificially expanding the training ...
Evaluate and preserve top k to update the plan pool.
List studies for @plan 1 (resource: @paper 1)
EEG Data Augmentation and EEG Generation
SearchPaper("EEG Data Augmentation") not in Pool
@paper 1: GANSER: A Self-supervised Data Augmentation Framework for EEG-based Emotion Recognition
Follow the related work to derive the $\phi(A_3^{(g)})$
List bottlenecks of @plan 1 (resource: @paper 1)
GAN is unstable while training for augmentation
SearchPaper("Generative Models") not in Pool
@paper 2: High-resolution image synthesis with latent diffusion models
Follow the related work to revise your plan to derive the $\sigma(A_3^{(g)})$
List insights of @plan 1 (resource: @paper 1)
... integrate generative adversarial networks with ... @paper 1: ... adversarial ...
List insights of @plan 2 (resource: @paper 2)
... propose a diffusion model for EEG data augmentation ... @paper 2: ... latent diffusion ...
Merge the insight of two solution and propose a new $\delta(A_3^{(g)})$
$\pi(P_i^{(t)} \mid C^{(t)}, E^{(t)})$
Revise the Plan via Observation
Exploitation Stage
Plan of the Manuscript
$P_1^{(t)}$ *Introduction* This section introduces the motivation and context ...
$P_2^{(t)}$ *Related Work* This section reviews prior research relevant to EEG ...
$P_3^{(t)}$ *Methodology* This section presents the proposed diffusion model ...
...
Observation for the Plan
$E_1^{(t)}$ Extract "*EEG feature encoding*" from @paper 1
$E_2^{(t)}$ Extract "*diffusion process*" from @paper 2
...
Context for the Plan
$C_1^{(t)}$ Extract "*framework description*" from @draft
...
Draft for Plans $\{D_p^{(t)}\}_{p\leq i}$
... The input to the proposed diffusion model is a preprocessed EEG segment, represented as a matrix $\mathbf{x}_0 \in \mathbb{R}^{C\times L}$, where C denotes the number of EEG channels and L is the number of time points in each segment. To preserve both spatial (across channels) and temporal ...
Implement
Describe
Codes for Plans
... diffusion_model = create_eeg_diffusion_model(input_shape=input_shape, hidden_dims=...
Logs of the Codes
[2025-09-05 14:25:50] INFO: Accuracy: 0.8735 [2025-09-05 14:25:50] INFO: Precision: 0.8692
Revise the Plan via Action $\pi\left(\{P_r^{(t)}\}_{r>i} \mid \{D_p^{(t)}\}_{p\leq i}, \{P_q^{(t)}\}_{q\leq i}\right)$