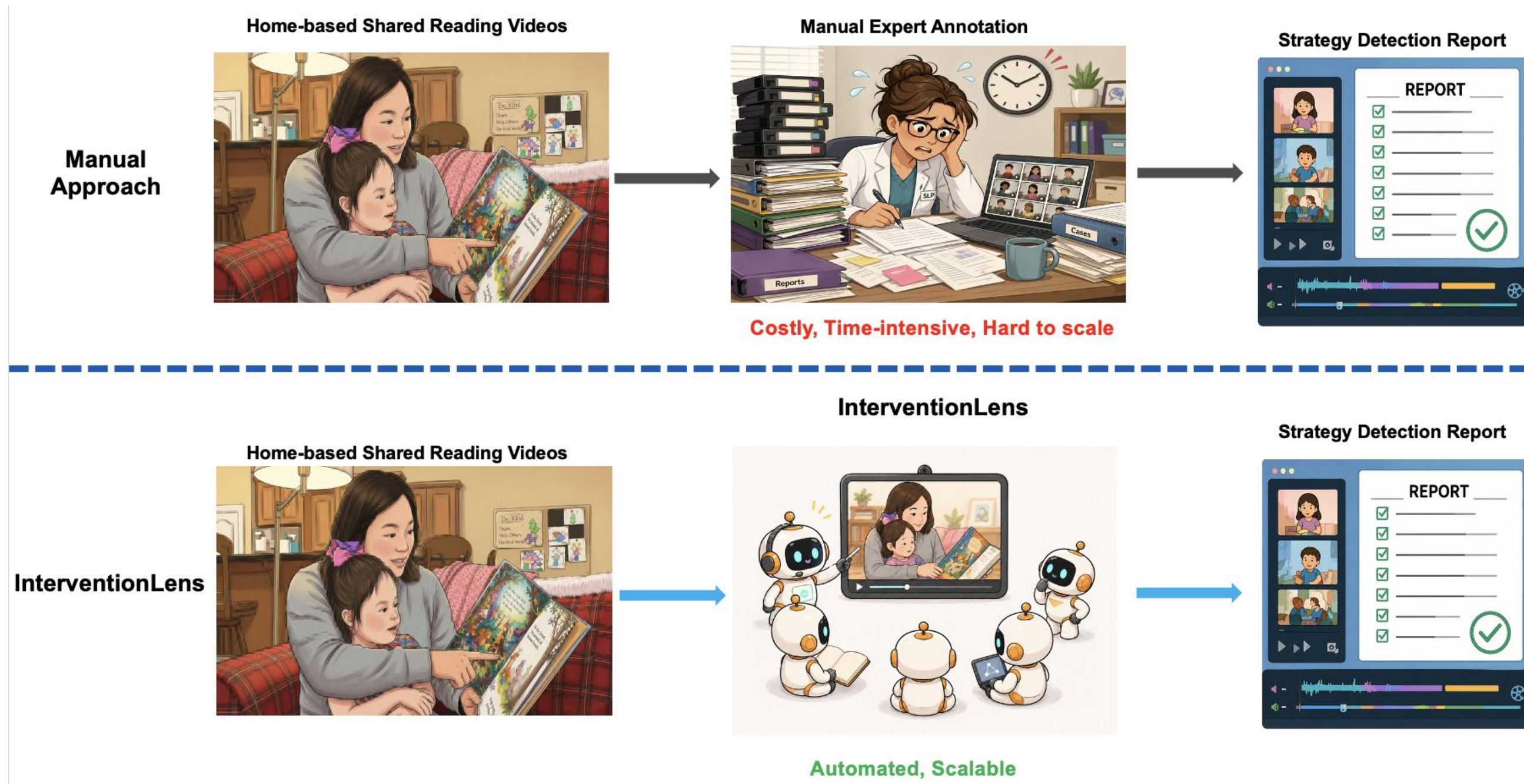


## Motivation



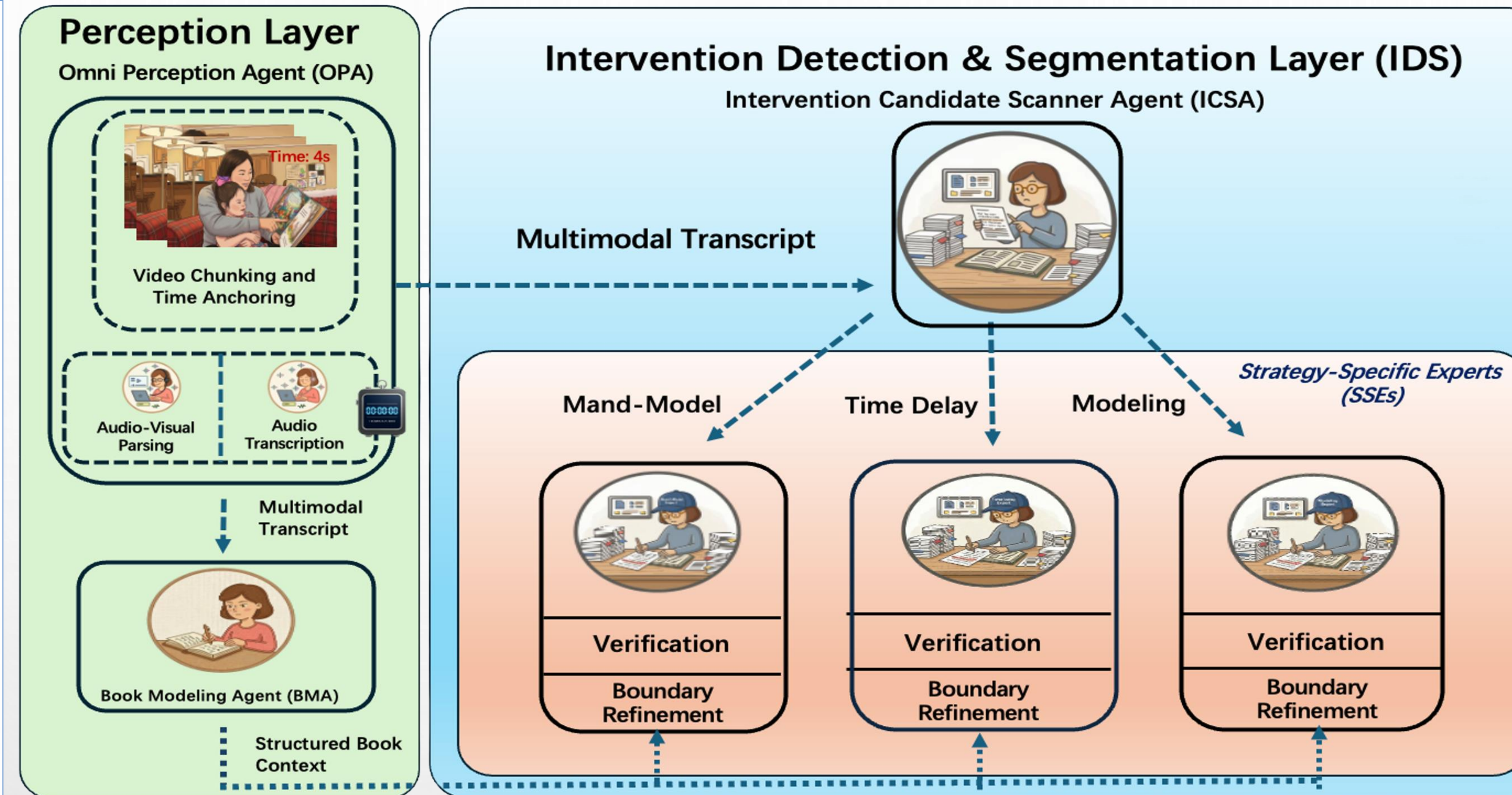
## Home-Based Intervention Challenges

- Intervention-Dynamics Challenge**  
Detecting intervention strategies requires understanding how caregiver prompts, child responses, and book context dynamically interact over time.
- Naturalistic Home Challenge**  
Real-world home settings introduce camera motion, occlusions, and background noise, weakening the reliability of automated perception.
- Data Scarcity Challenge**  
Limited high-quality annotations make training or fine-tuning data-intensive models difficult.

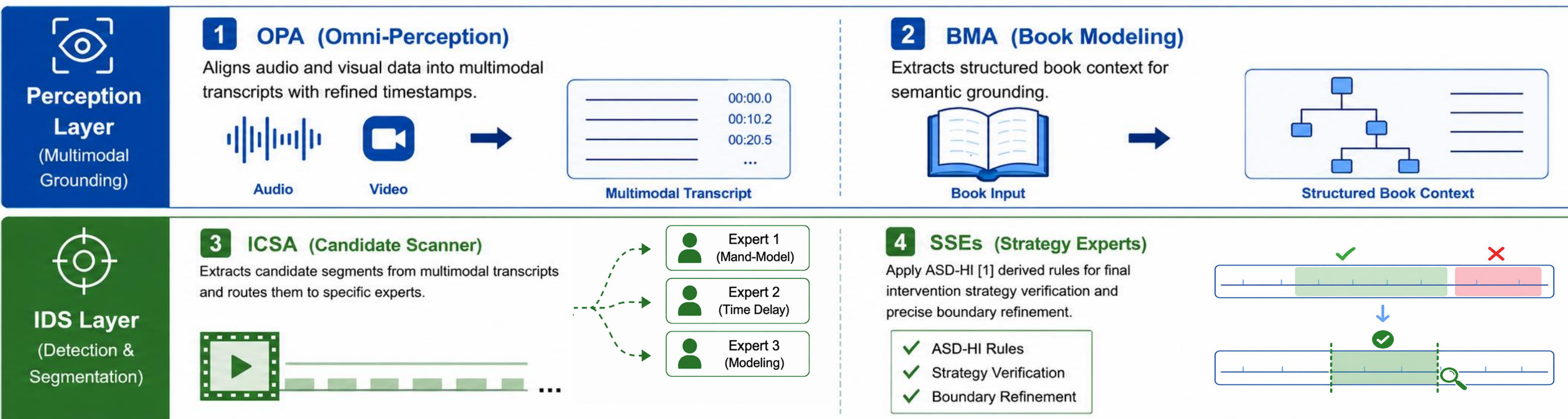
## InterventionLens

- Decoupled Perception & Detection**  
InterventionLens decouples perception from detection to handle noisy and unstructured home videos.
- Book-Grounded Strategy Verification**  
Models structured book context to ground caregiver-child-book interactions and uses coarse-to-fine expert verification to capture dynamic intervention strategies.
- Training-Free Design**  
Avoids task-specific training and parameter fine-tuning, reducing dependence on large annotated datasets.

## InterventionLens Overview

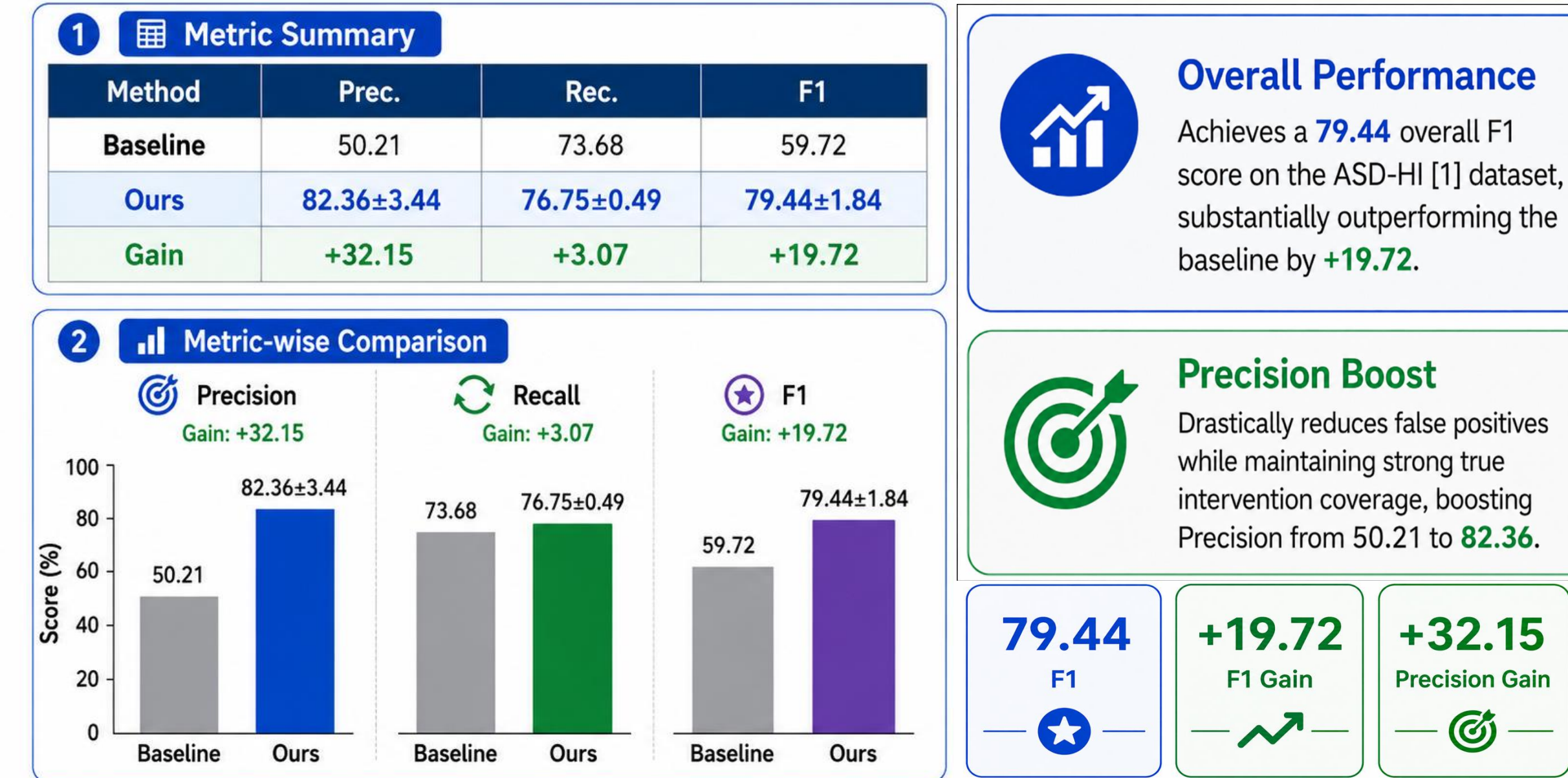


InterventionLens is a training-free multi-agent framework for automated detection and temporal segmentation of ASD intervention strategies (Mand-Model, Modeling, Time Delay), which features a two-layer architecture to decouple multimodal perception from strategy detection:

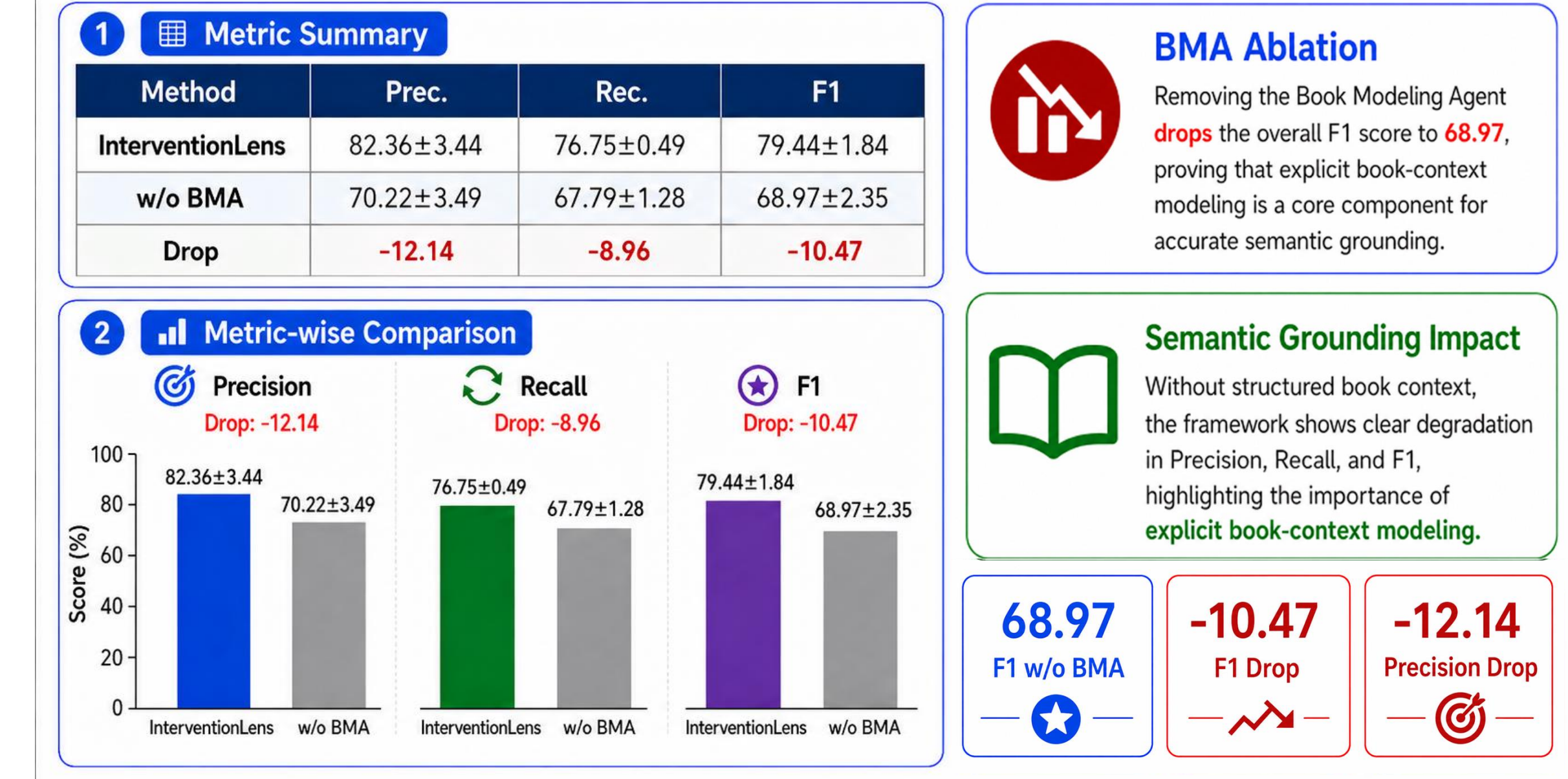


## Experiments

### Overall Results on ASD-HI



### Overall Results under BMA Ablation



#### Reference

1. Li, Zhaohui, et al. "ASD-HI: A Parent-Child Interaction Dataset for Automated Assessment of Home Intervention." International Conference on Artificial Intelligence in Education. Cham: Springer Nature Switzerland, 2025.

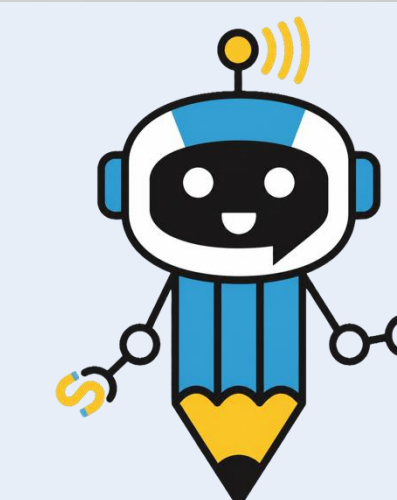


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