

Signing for Care: A Demo and Initial Evaluation of an American Sign Language Learning Tool for Emergency Medical Responders

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Background

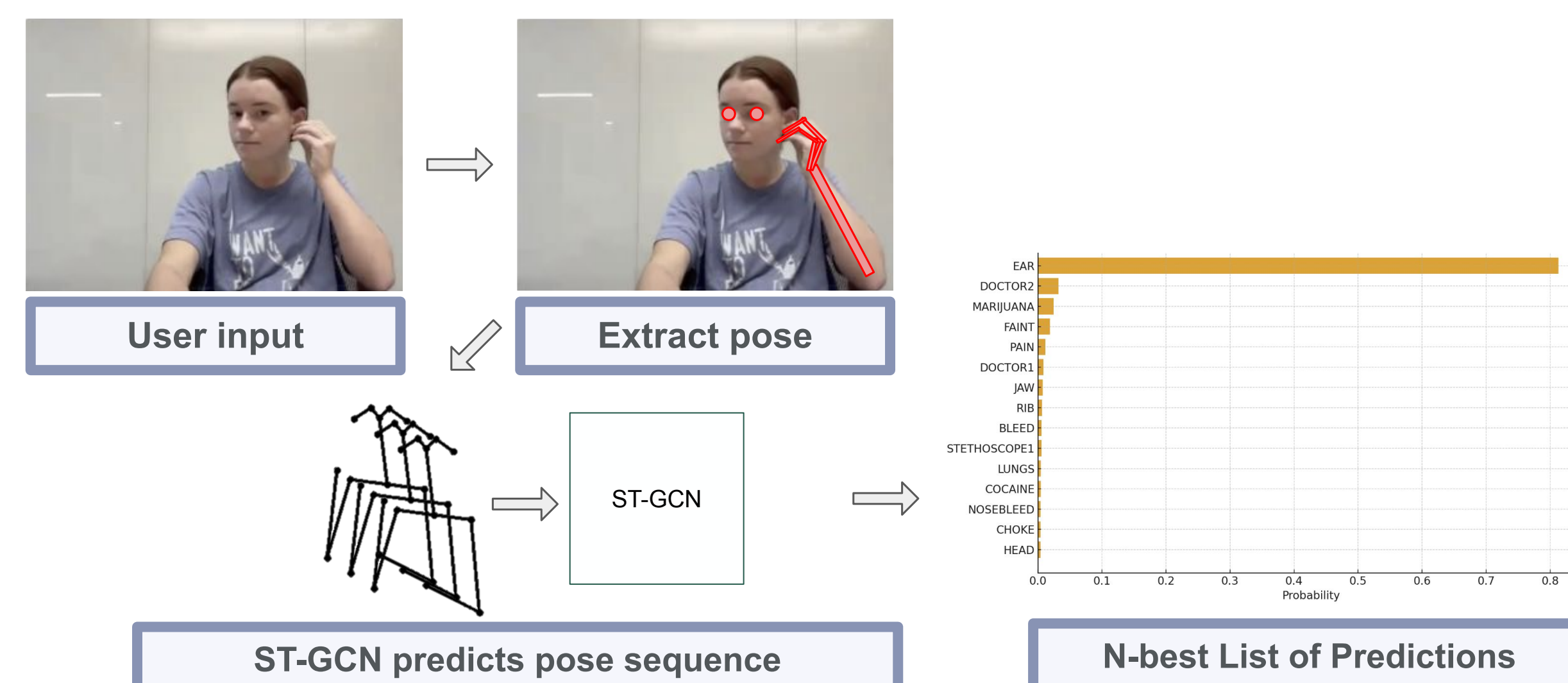
- Problem:** Deaf and Hard of Hearing (DHH) people face miscommunication and reduced access to care in medical emergencies.
- Gap:** No existing ASL-learning platforms are designed specifically for Emergency Medical Responders (EMRs).
- Goal:** Develop an AI-based ASL learning tool to teach essential medical signs to EMRs.



83% of EMRs report losing critical information when communicating with Deaf patients [Rotoli et al, 2022].

System Overview

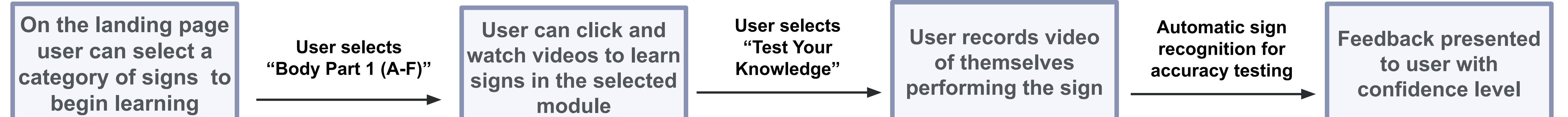
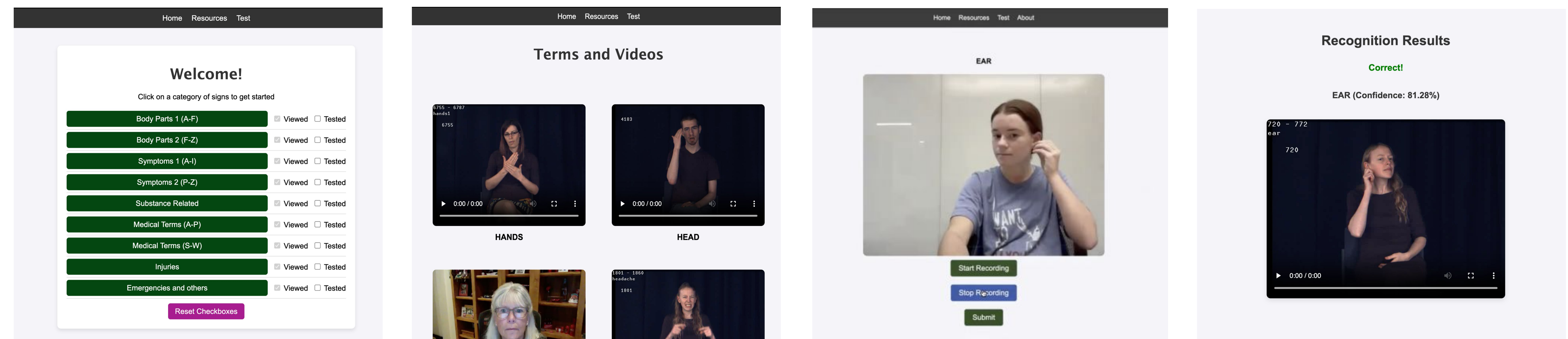
- Vocabulary Selection:**
 - 79 emergency-related signs across 9 categories, including: *body parts, medical terms, symptoms, substances, injuries, etc.*
- Recognition Model:**
 - ST-GCN architecture



- Interface Components:**
 - Home Page: Choose module and track progress
 - Test Page: Real-time feedback (Correct/Try Again)
 - Resources Page: Instructional videos, online learning resources, and social learning platforms

User Study

- Preliminary evaluation with 5 EMRs (average age = 21; mean ASL learning experience = 2.7 years)
- Session overview: 70-minute sessions with consent, study briefing, and tool demonstration.
- Independent usage and feedback: Participants practiced by testing at least five signs and shared post-session insights.
- Qualitative review: Interview transcripts were reviewed for recurring usability issues and feature suggestions.



Key Findings

- Communicating without an interpreter** in emergency medical settings is challenging, and written communication is inefficient.
"You're not able to provide the level of care... you normally would"
- Participants found the **tool intuitive and effective**, especially the video-based learning.
"I could watch someone do it repeatedly until I had it down"
- At times, participants were unsure if **errors** stemmed from their signing or the recognition system.
- Participants recommended adding (1) **corrective feedback** after each sign test and (2) **real-world scenarios** where the sign can be used at the end of each module.
"Maybe it'll show you a patient with some affliction or injury"
- Participants recommended adding **additional vocabulary** concerning patient histories and EMS procedures.

Future Work

- Develop scenario-based testing modules.
- Incorporate additional vocabulary
- Improve recognition accuracy with larger datasets.
- Add additional progress trackers, such as performance trends and module completion.

Resources

- Prototype and code available on GitHub.
- Dataset sources used in training and presentation of signs: ASL Citizen and American Sign Language Lexicon Video Dataset (ASLLVD).

GitHub

