RIO RESEARCH & INITIATIVES CENTER

SRF 9
The 9th Students Research Forum

جامعة الأمير سلطان
PRINCE SULTAN UNIVERSITY

INNOVATE FOR IMPACT
HACKATHON 2025

هاكاثون الابتكار من أجل الأثـر

YourVoice (صوتك)

Let Your Hands Speak

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Problem

Deaf patients using Arabic Sign Language struggle to communicate in healthcare settings

A lack of ArSL interpreters leads to misdiagnosis and delayed care.

Written communication is slow and ineffective in emergencie.

Existing tools focus on English sign language, excluding Arabic users.

This leads to inequality in access to quality healthcare, a violation of inclusivity and efficiency goals under Saudi Vision 2030.

Solution

Bridging silence and care, YourVoice is an AI-powered tool that transforms Arabic Sign Language into real-time text, creating inclusive and efficient communication between Deaf patients and doctors.

Key Features

- Real-time ArSL-to-Text conversion
- Designed specifically for medical and emergency settings
- Removes dependency on interpreters, available 24/7

Methodology

Dataset

- KArSL dataset: Arabic sign gestures from native signers, 155 medically relevant signs (symptoms, diseases, interactions)

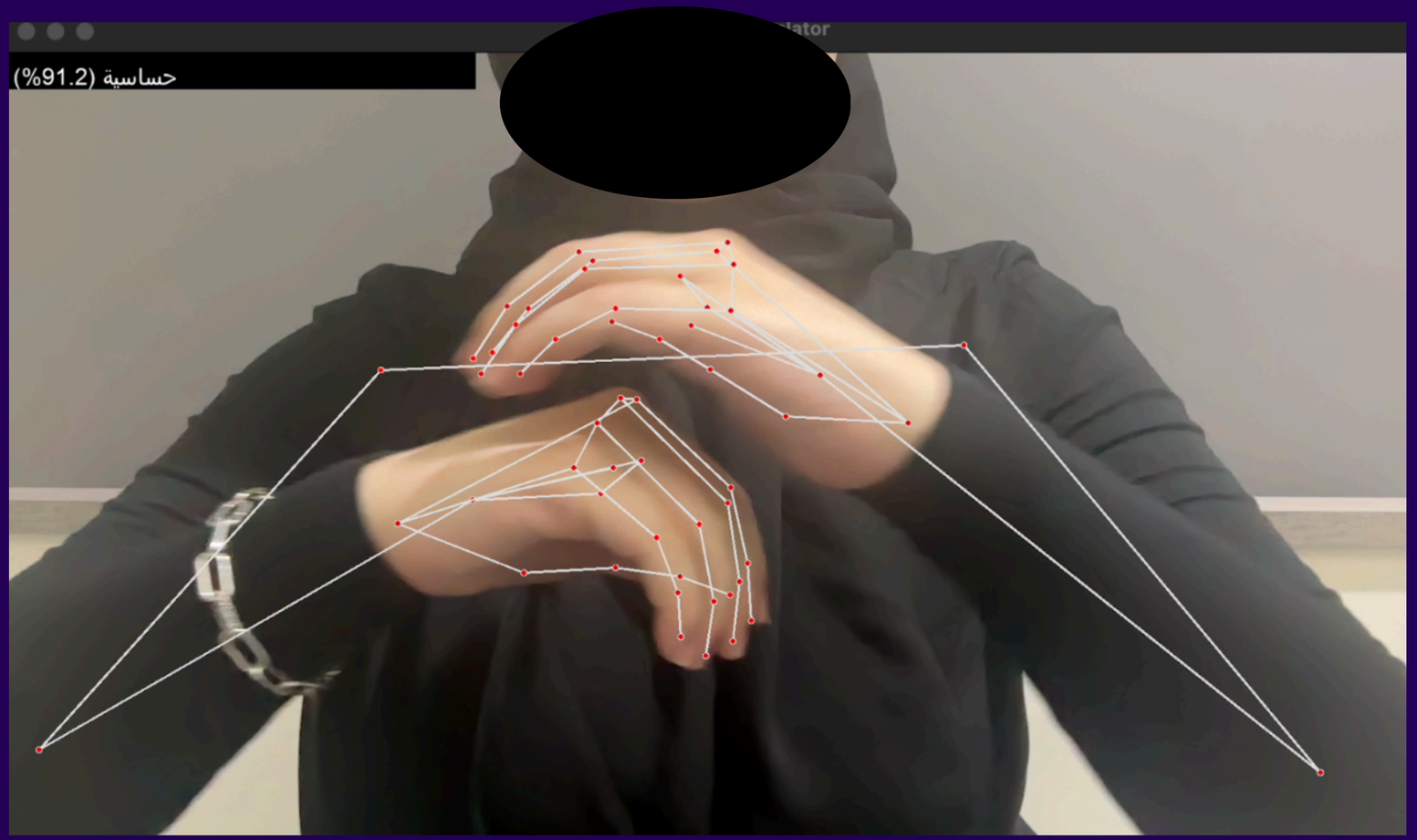
Pipeline

- MediaPipe extracts 3D keypoints.
- BiLSTM interprets signs into text.
- Present the Text on the screen

Implementation plan

1	2	3	4
Data Preparation	**Model Training**	**Real-Time Integration**	**Testing**
Process the KArSL dataset for medical gestures	Build & train BiLSTM with MediaPipe keypoints	Connect model to live camera	Evaluate performance across different signers

Demo



This screenshot demonstrates the model’s strong real-time performance by correctly predicting the sign (حساسية) from live input.

Feasibility & Scalability

Built with lightweight AI, easily adaptable for web and mobile use.

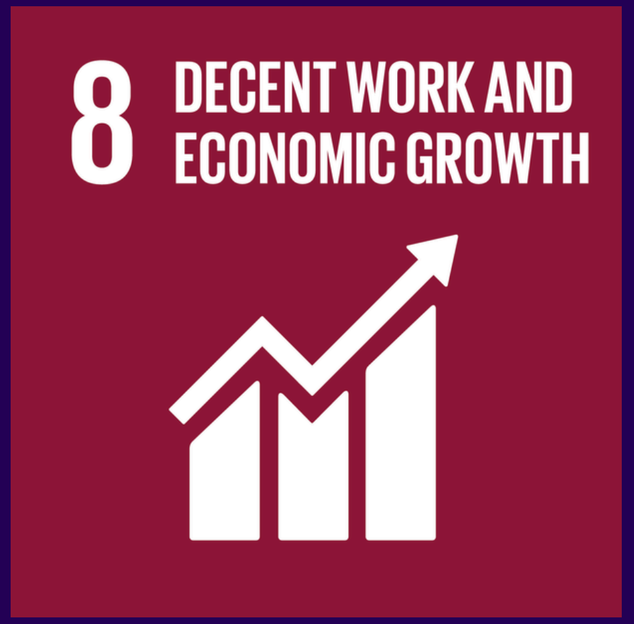
Can be integrated into hospital systems for real-time patient communication.

Designed for low-latency performance, even on standard devices.

Scalable to include more signs, dialects, and regional healthcare centers across the Arab world.

Impact & Sustainability

Equal access to healthcare for Deaf individuals



Cuts interpreter costs, improves efficiency

Sustainable AI for accessibility

Expected Outcomes

- Real-time Arabic Sign-to-Speech communication
- Faster and clearer doctor–patient interaction
- Basis for future two-way translation
- Scalable for hospitals and other public services