Global Gloss: A Data Collection and Annotation Web Platform for Deaf Community

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Motivation

- The creation of a large annotated dataset will broaden the opportunities and optimize the performance of the ML application in hand gesture related projects.

Dataset	Vocabulary	Signers	Signer-independent	Videos	Continuous	Real-life
Purdue RVL-SLLL ASL [65]	104	14	no	2,576	yes	no
RWTH Boston 104 [124]	104	3	no	201	yes	no
Video-Based CSL [54]	178	50	no	25,000	yes	no
Signum [118]	465	(24 train, 1 test) - 25	yes	15,075	yes	no
MS-ASL [62]	1,000	(165 train, 37 dev, 20 test) - 222	yes	25,513	no	yes
RWTH Phoenix [43]	1,081	9	no	6,841	yes	yes
RWTH Phoenix SI5 [74]	1,081	(8 train, 1 test) - 9	yes	4,667	yes	yes
Devisign [22]	2,000	8	no	24,000	no	no

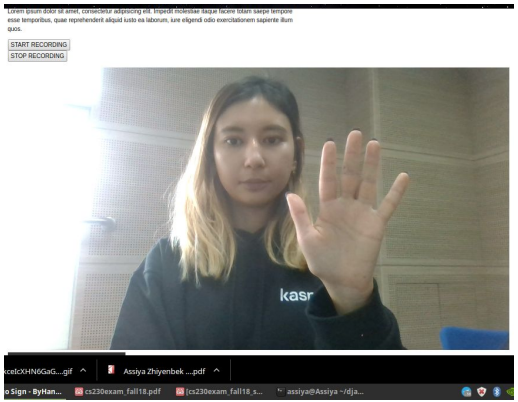
Table 1. Bragg, Danielle, et.al. 2019. “Sign Language Recognition, Generation, and Translate: An Interdisciplinary Perspective”

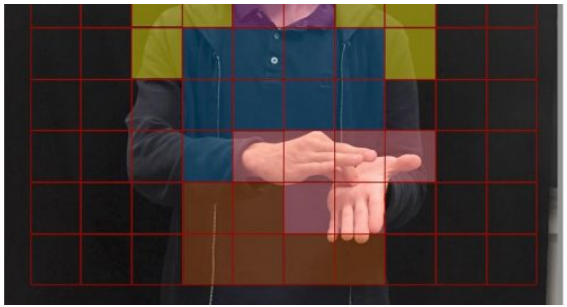
Goal

- To create a large-scale dataset of sign languages with annotations.
- This will be done through the user-friendly website for the deaf community.

Interaction

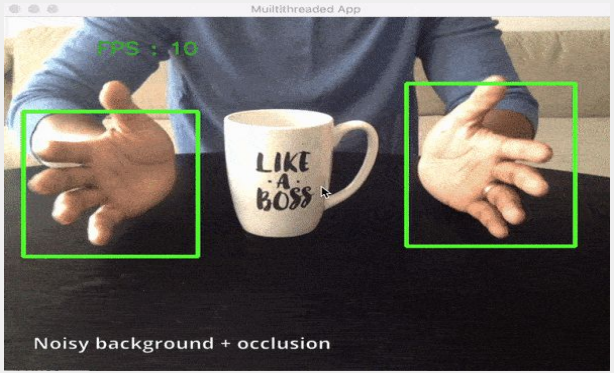
- User records himself or herself using their web camera





Hand detection

- User annotates someone else video using glosses, not his own, and these annotations were generated using machine learning

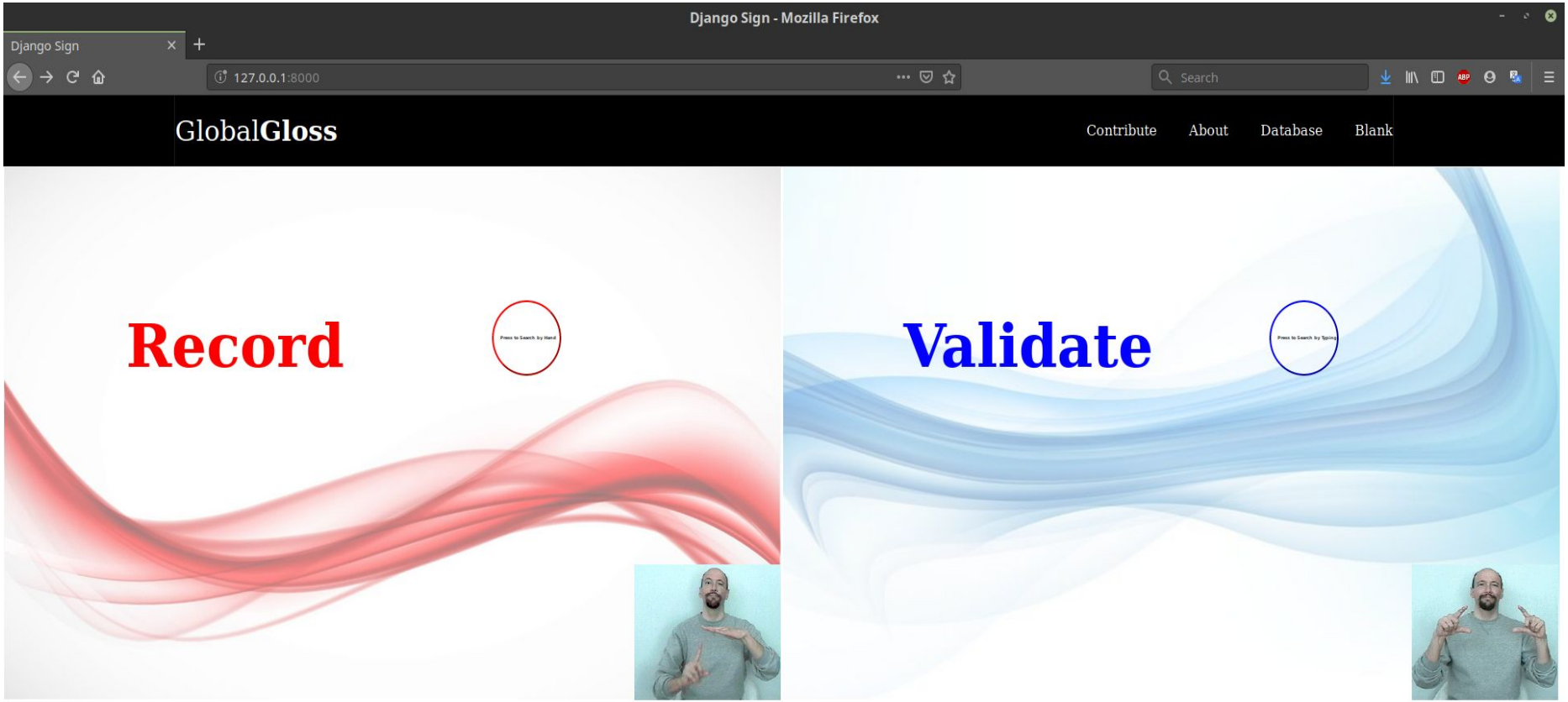


The software

Work done

- Research on related topics: datasets, hand detection, gesture recognition
- The early version of the interface (Web framework: Django).
- Web-site functionality records a video and adds it to the database.
- Integrated pre-trained model (on Pytorch) of hand detection with ‘EgoHands’ dataset.

Main Page. Early Version.



Future work

- To improve hand detection accuracy using other datasets
- Integrate hand gesture recognition model
- To finish user-friendly interface of the website and it’s functionality:
  - Video annotation by the user
  - Modify annotations and update the database
- Improve the performance of the handshape classification model
- To conduct user studies with deaf people
- To improve the design according to the feedback

Extra features and possible applications

- Users will indicate the sign language (American, Russian, Kazakh, Chinese, Indian etc), so the datasets will be categorized.
- The website will provide user-friendly dictionary function, which will translate Sign Language to English/Russian/Kazakh and vise-versa. This feature will be useful for people who want to learn sign language.