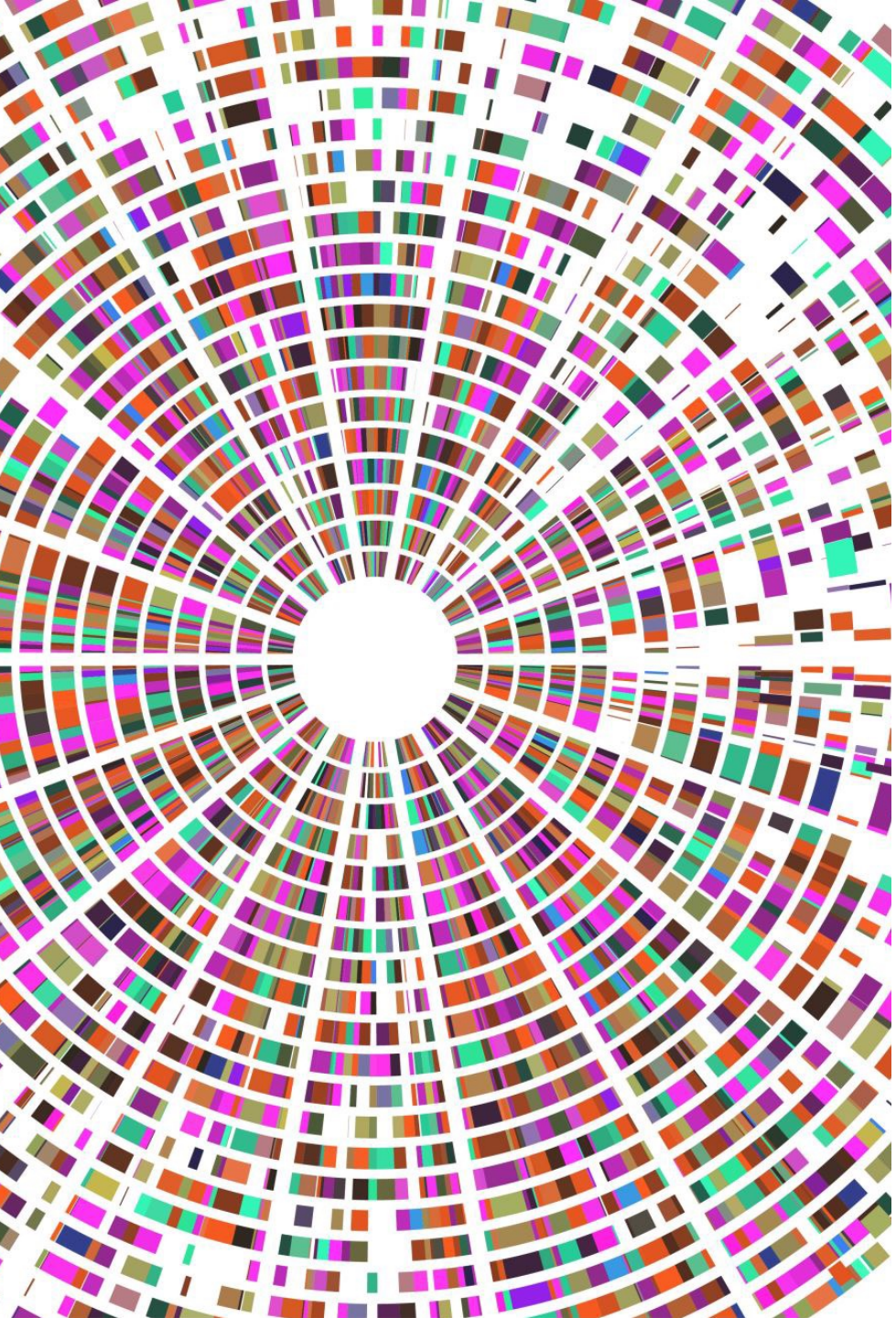

โครงการสัมมนาวิชาการวิจัย มหาวิทยาลัยมหาสารคาม

ประจำปีงบประมาณ 2566

26 มกราคม 2566

MISL - INFORMATION TECHNOLOGY

MULTI-AGENT INTELLIGENT
SIMULATION LABORATORY
RESEARCH UNIT

Multi-agent Intelligent Simulation Laboratory Research Unit (MISL)

MISL is a group of lecturers, researchers, and students who are interested in a wide range of the research areas includes artificial intelligence, machine learning, deep learning, computer vision and image processing, pattern recognition, intelligent system, multi-agent system, computer simulation, game theory, resource allocation, logistic/transporation, etc.

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Sign Language Recognition using Deep Learing Approach From Detection to Recognition

The world health organization found that more than 34 million people suffer from hearing loss and these people need to use sign language to communicate.

Hence, the sign language recognition system is proposed to communicate with hearing loss people and others. In this research, we aim to propose an end-to-end system to recognize the Thai sign language from video.

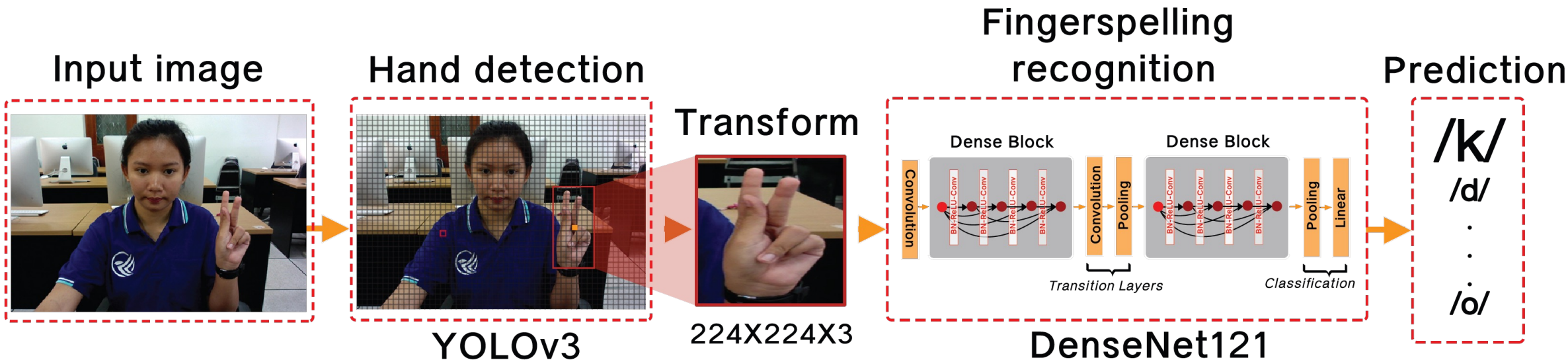
An End-to-End Thai Fingerspelling Recognition Framework with Deep Convolutional Neural Networks

(A)

(B)

Examples of the 1-stage Thai fingerspelling consonants that recorded in (A) non-complex and (B) complex backgrounds.

An End-to-End Thai Fingerspelling Recognition Framework with Deep Convolutional Neural Networks



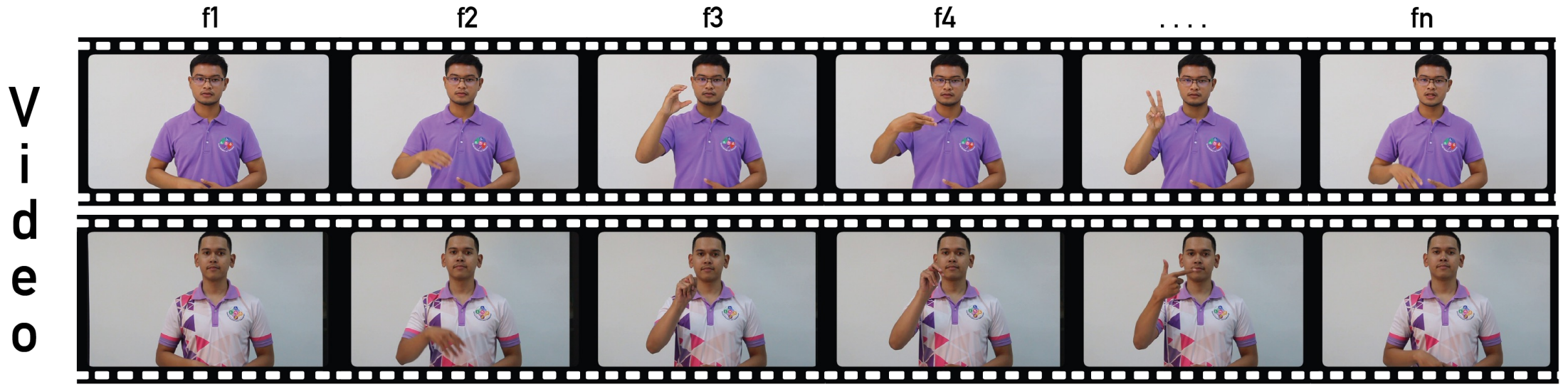
The proposed framework of the 1-stage Thai fingerspelling recognition

An End-to-End Thai Fingerspelling Recognition Framework with Deep Convolutional Neural Networks

Performance evaluation of the CNN architectures on the validation and test sets

CNNs	Validation and test accuracy (%)	
	Valid	Test
MobileNetv2	99.47 ±0.003	98.02
DenseNet121	99.27 ±0.009	98.04
InceptionResNetV2	97.29 ±0.004	96.62
NASNetMobile	97.09 ±0.007	95.23
EfficientNetB2	93.38 ±0.005	93.09

Dynamic Fingerspelling Recognition



Examples of dynamic Thai fingerspelling dataset. Note that, f1, f2, ..., fn means frame number 1, 2, ..., n.

Dynamic Fingerspelling Recognition

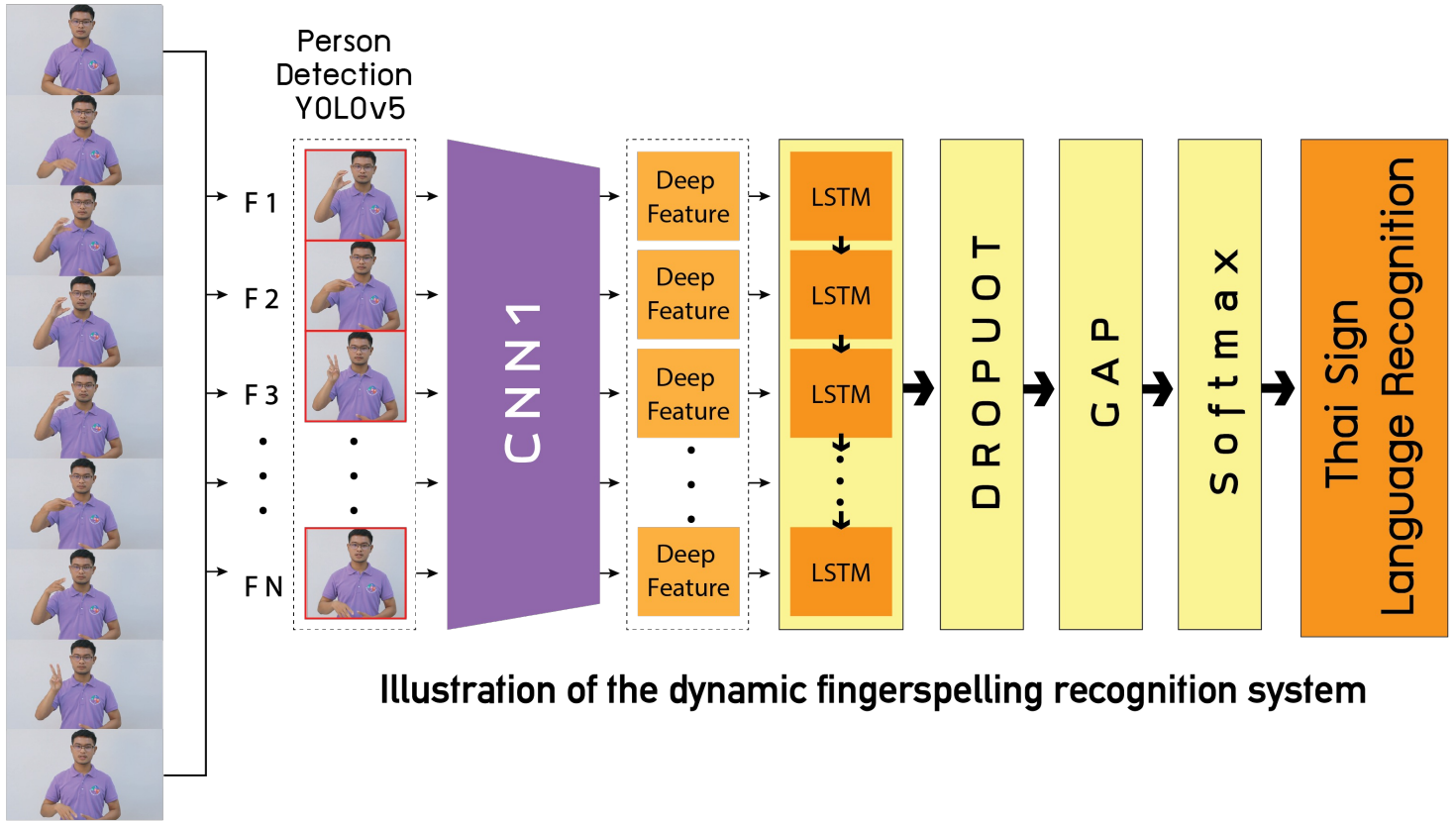


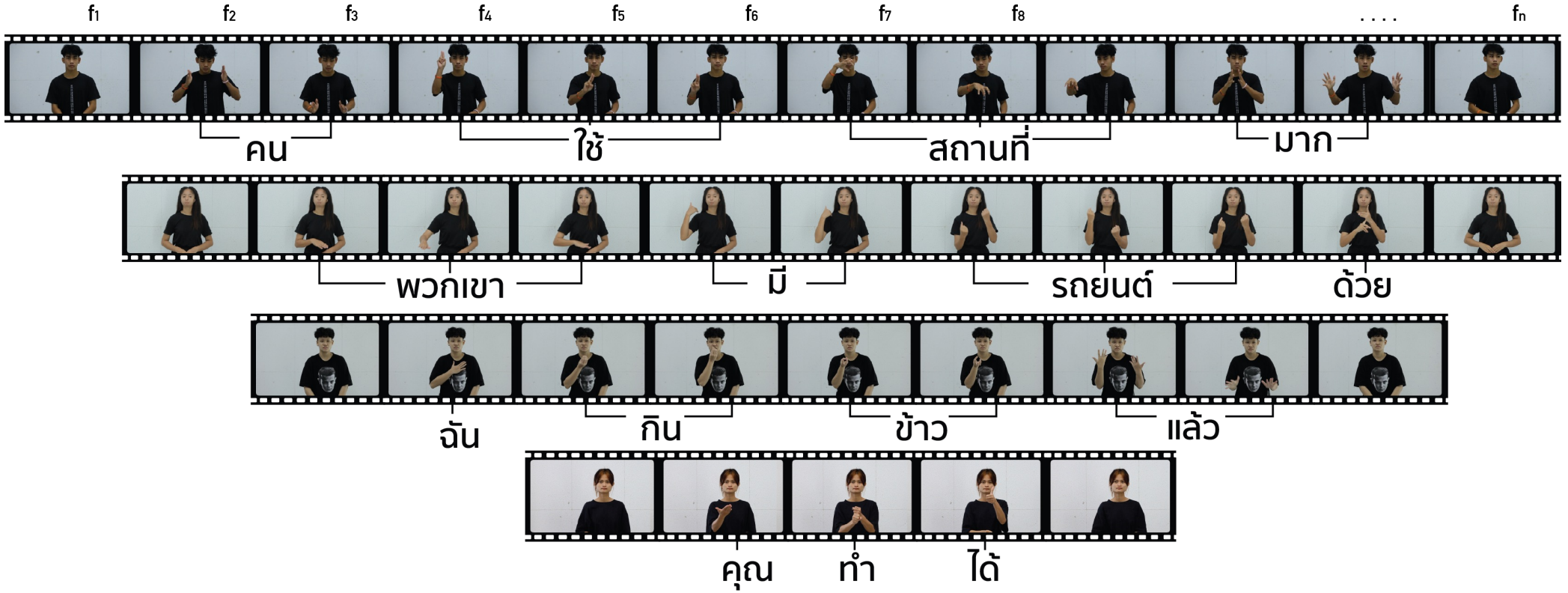
Illustration of the dynamic fingerspelling recognition system

Dynamic Fingerspelling Recognition

Evaluation of Fusion CNN-LSTM

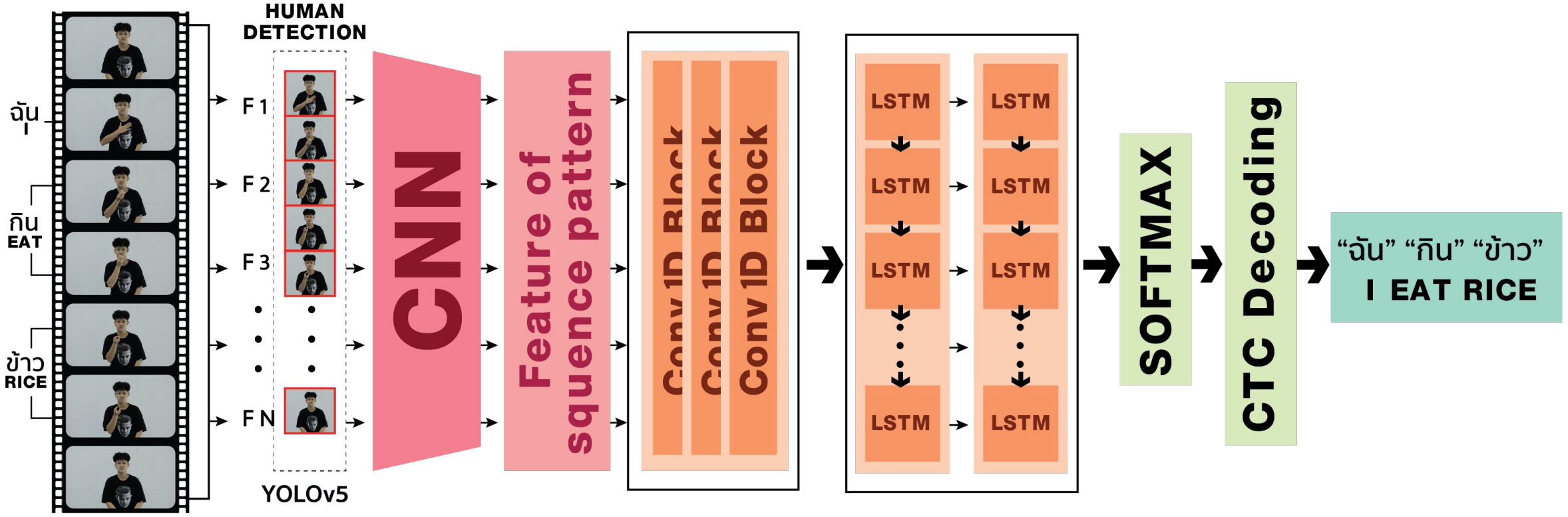
Fusion CNNs	LSTM		
	5-CV	Test Accuracy (%)	Testing time (seconds per video)
MobileNetV2+DenseNet201	85.29±3.395	84.29	13.74s
MobileNetV2+ResNet50	89.42±3.670	88.62	16.20s
ResNet50+DenseNet201	88.36±2.917	87.76	16.54s

Sign Language Recognition



Examples of dynamic sign language dataset

Sign Language Recognition



Thank you for your attention