NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

School of Computer Science and Engineering
College of Engineering

Automatic Recognition of Facial Expressions

SCSE21-0075

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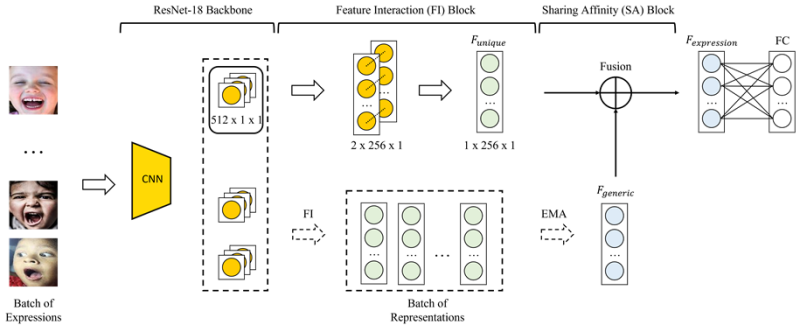
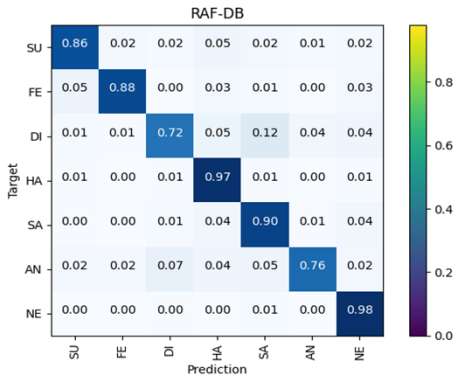
Project Objectives

This project aims to develop a novel facial expression architecture that is more accurate, robust, lightweight and efficient than prior-art. Starting from a ResNet-18 backbone, the project introduces a Feature Integration (FI) block, a Sharing Affinity (SA) block, and integrates the Additive Angular Margin Loss (AAML). Our final model delivers record-breaking performance on the RAF-DB dataset, while remaining more lightweight and efficient than prior-art.

Model Architecture



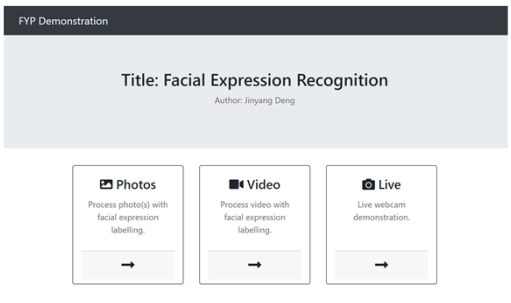
RAF-DB Performance



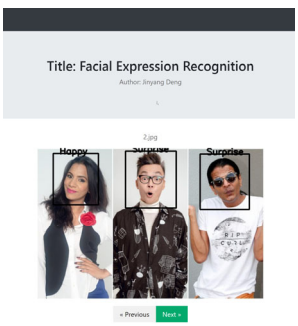
Project Outcomes

	Average Accuracy	Overall Accuracy	Million of Parameters	Estimated GFLOPs
DAN	89.70	85.32	19.7	0.289
LResNet50E-IR	89.075	-	23 (est.)	-
PSR	88.98	80.78	138 (est.)	-
FER-VT	88.26	80.63	11 (est.)	-
DACL	87.78	-	11.2	0.221
Ad-Corre	86.90	-	22 (est.)	-
Our Model	**92.24**	**86.69**	**11.2**	**0.221**

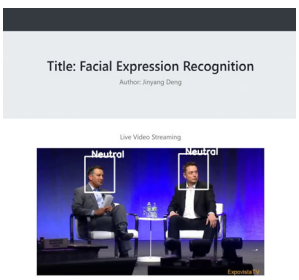
Comparing Our Model To Prior-Art On The RAF-DB



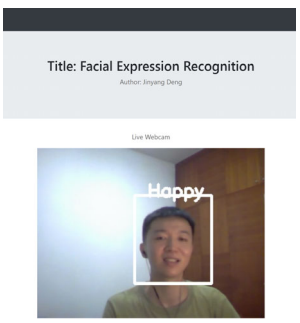
Our Prototype's Home Page



FER on Images



FER on Videos



Live FER