Human Intention Prediction Using Two-Stream Spatio-Temporal Features

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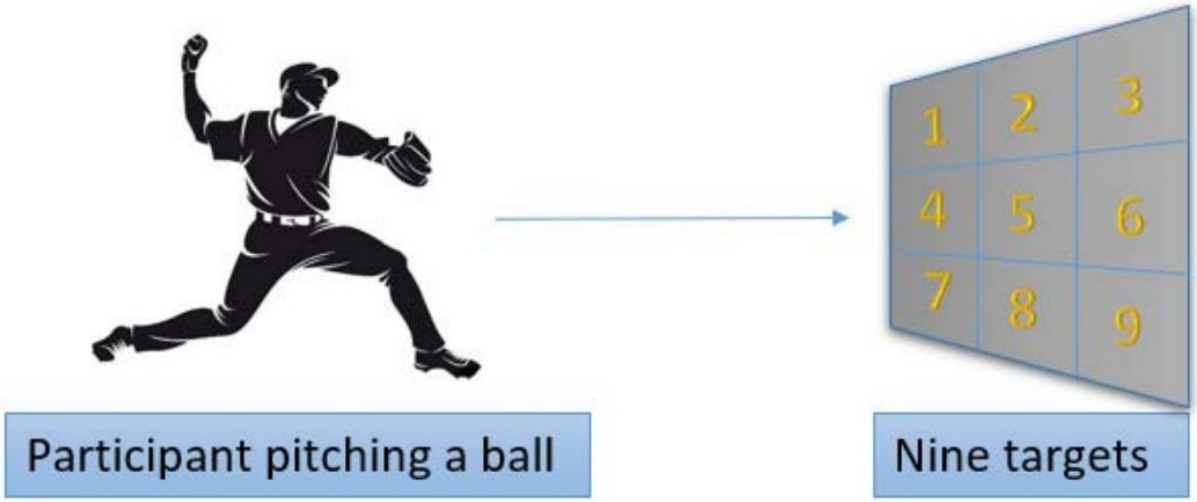
Experiment Overview



The experiment is about a human participant pitching a ball toward a robot (represented by a target area in the figure). The target area is divided into 9 grids which represent the 9 targets that the ball can hit. We expect "the robot" to be able to predict the intention of the participant, namely, which of the nine targets the participant is pitching the ball to.

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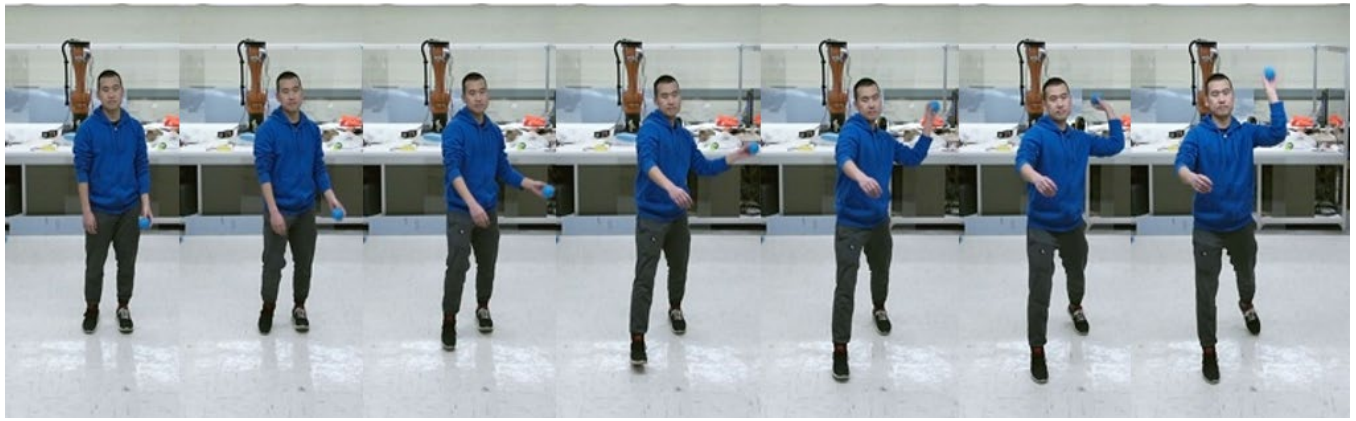
Training Data



RGB images sequence

Optical flow sequence

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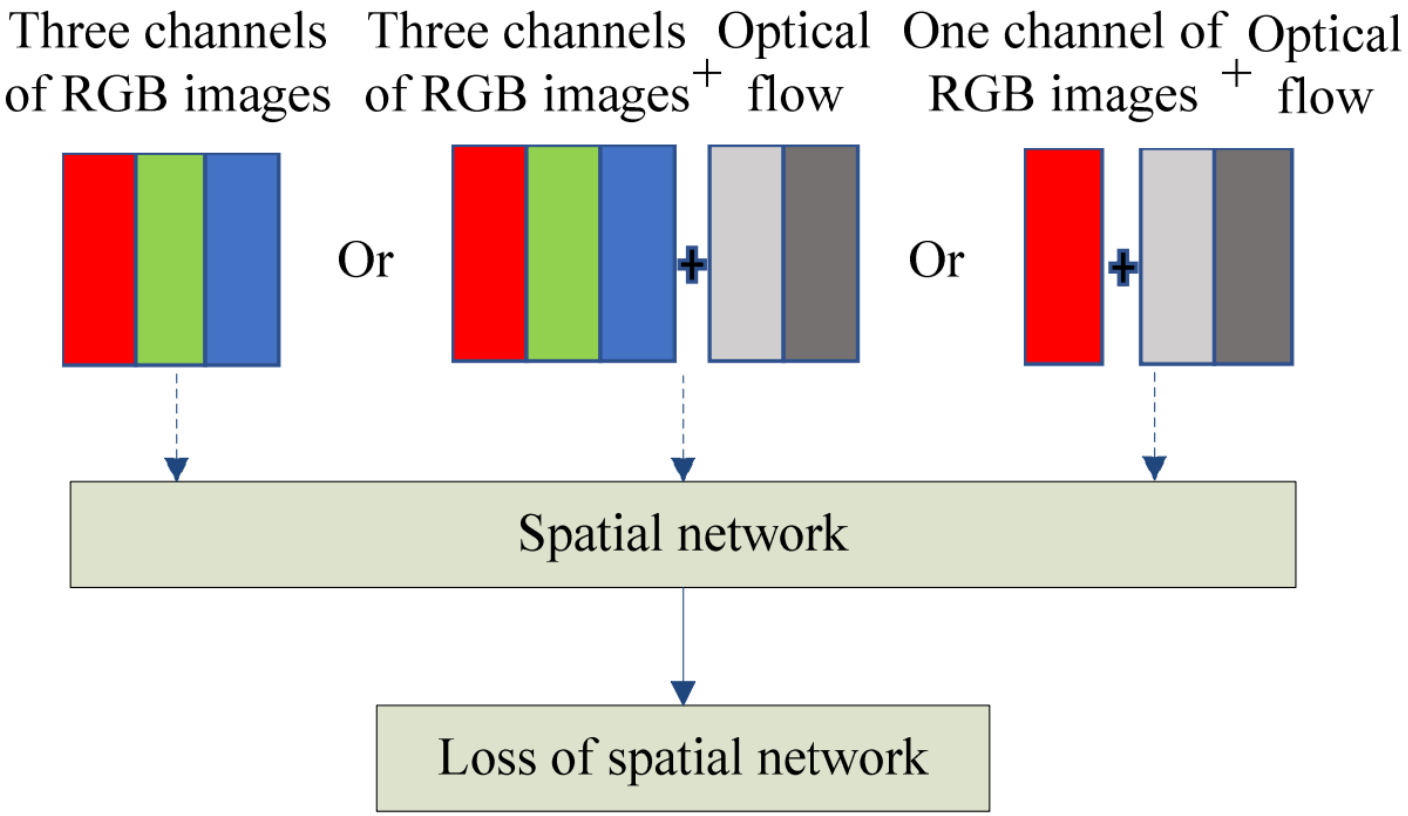
Approach

Spatial network:
Optimize early fusion methods of RGB images and optical flow for spatial network.



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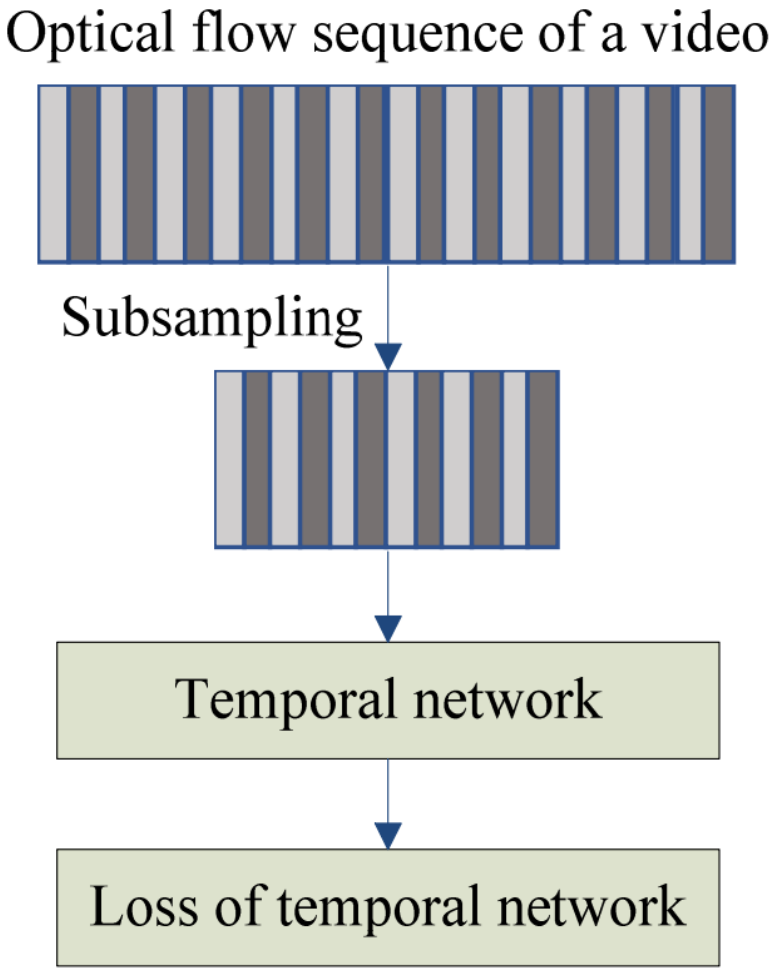
Approach

Temporal network:
Capture motion information in temporal network.



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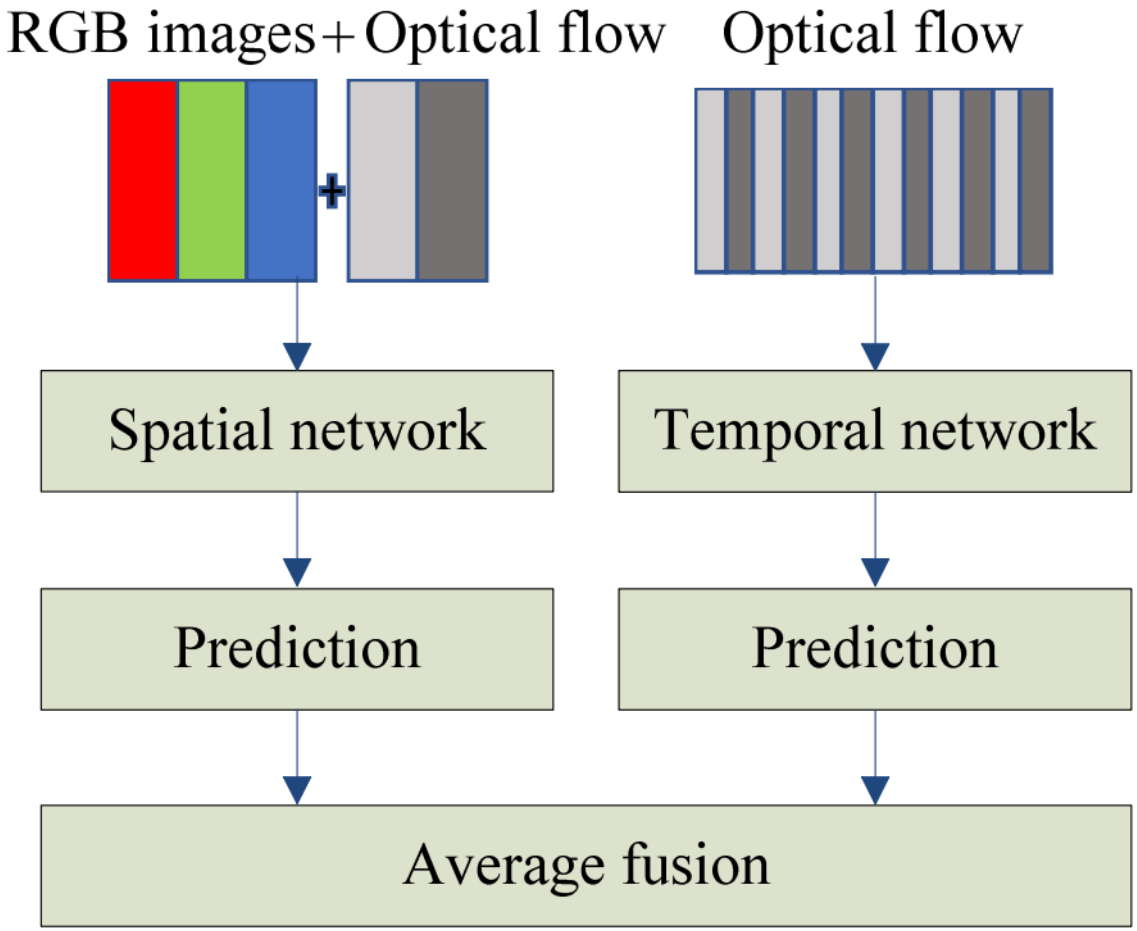
Approach

Two-stream network with average fusion:
Final average fusion to improve prediction performance.



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Results

Spatial Network Method	Data Augmentation	Prediction Accuracy
Three channels of RGB images	No	50%
	Yes	57.4%
Three channels of RGB images + two channels of optical flow	No	53%
	Yes	57.4%
One channel of RGB images + two channels of optical flow	No	51.8%
	Yes	63.89%

Temporal Network Method	Data Augmentation	Prediction Accuracy
Temporal network without fusion	No	68.5%
	Yes	69.4%
Final fusion of spatial network and temporal network	Yes	71.3%

Thank you!

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