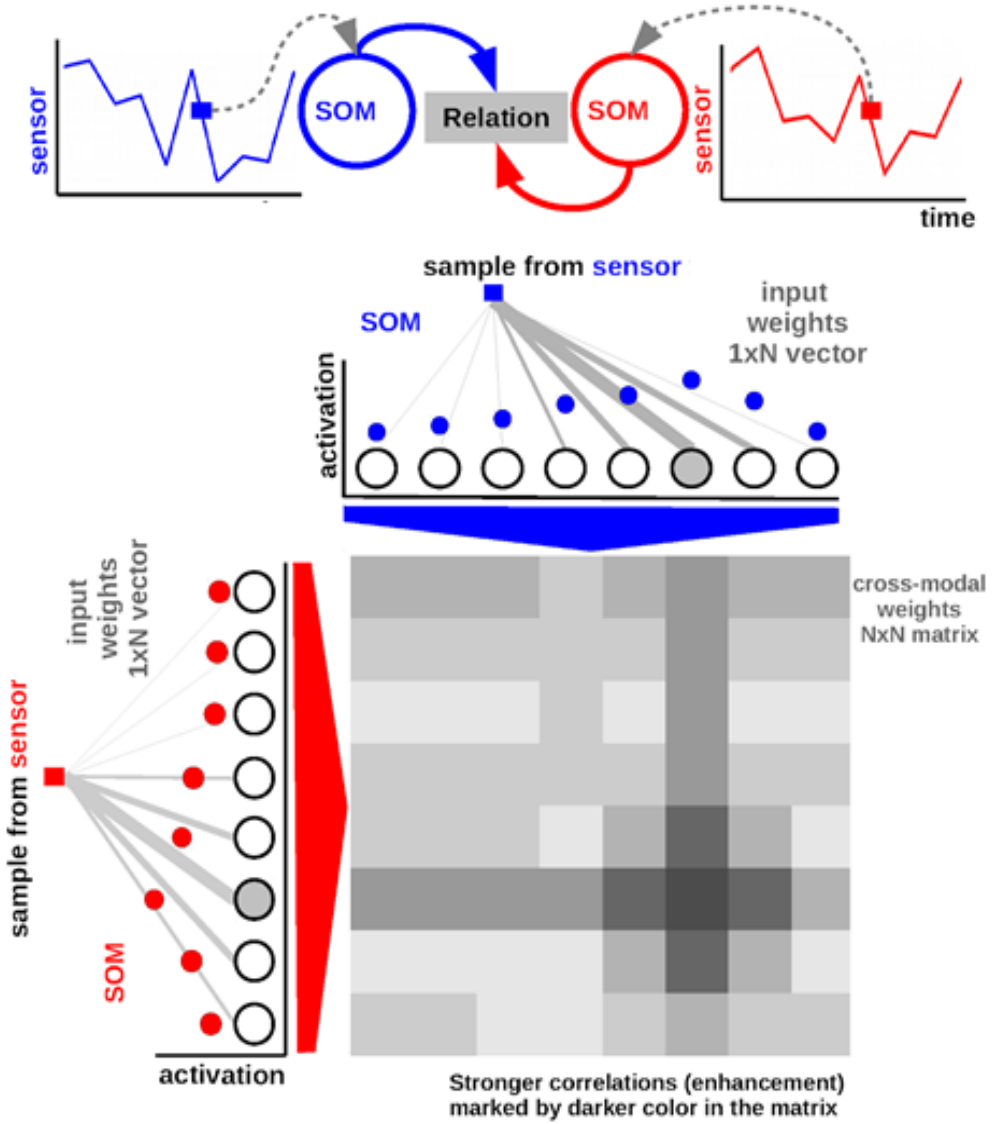
NeuroTHIx

IRENA

Invariant Representations Extraction in Neural Architectures

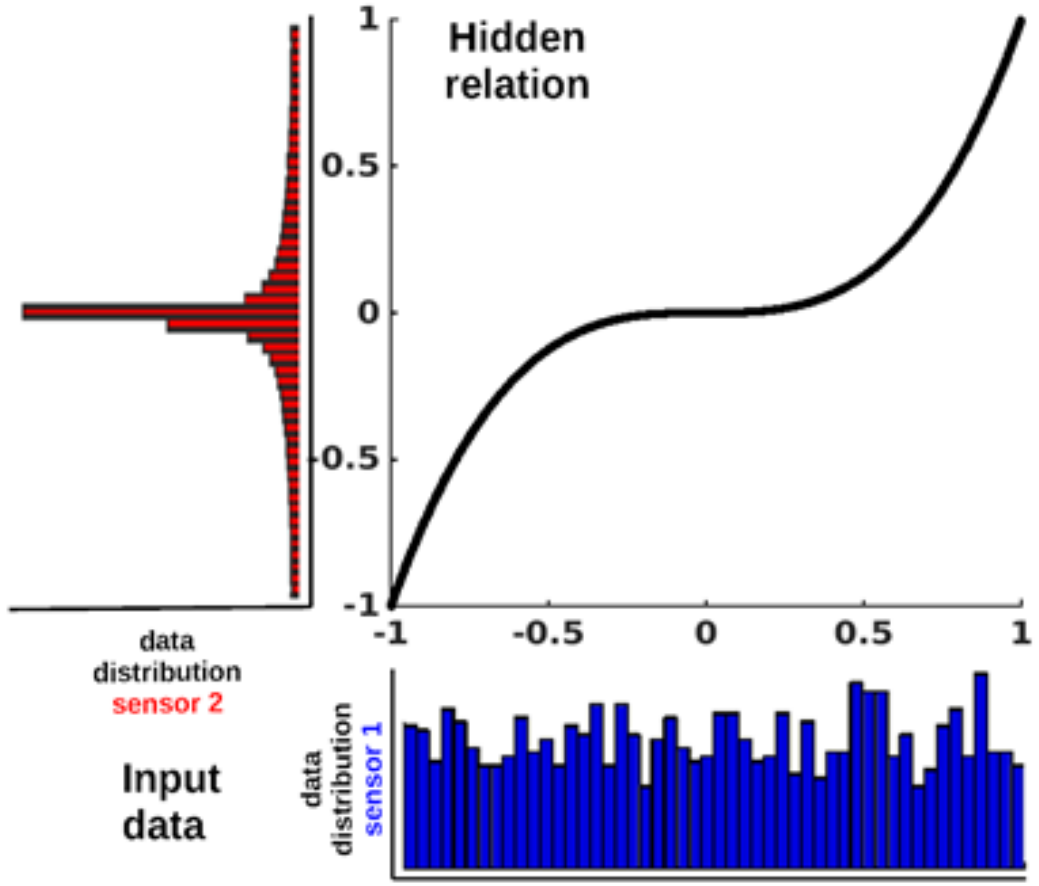
Dr. Cristian Axenie

Basic Model


sensor
SOM
Relation
SOM
sensor
time
sample from sensor
SOM
input
weights
1xN vector
activation
input
weights
1xN vector
sample from sensor
SOM
activation
cross-modal
weights
NxN matrix
Stronger correlations (enhancement)
marked by darker color in the matrix

Learning invariants in low-dimensional spaces

Learning invariants in 1D



Learning invariants in 1D

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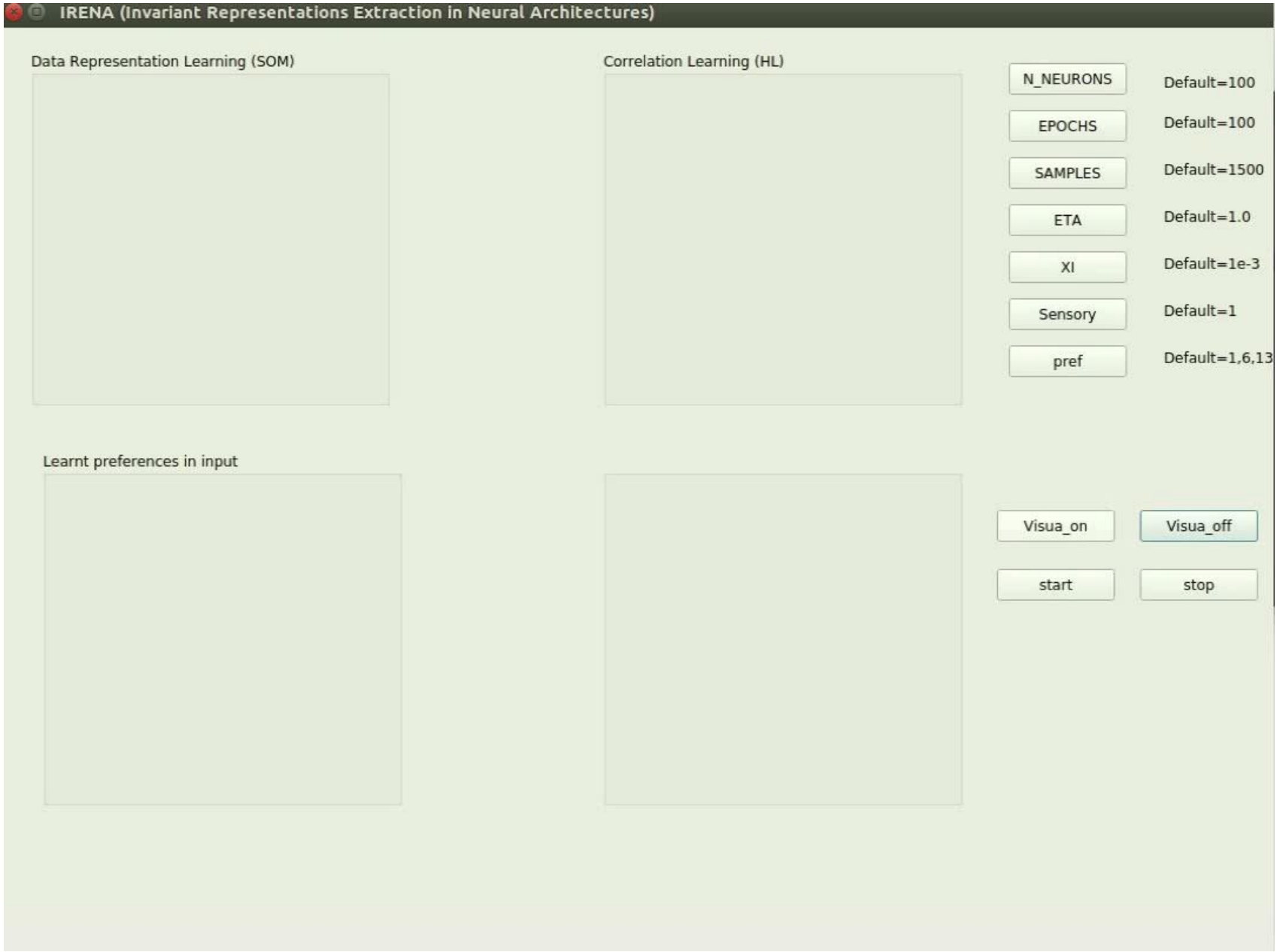
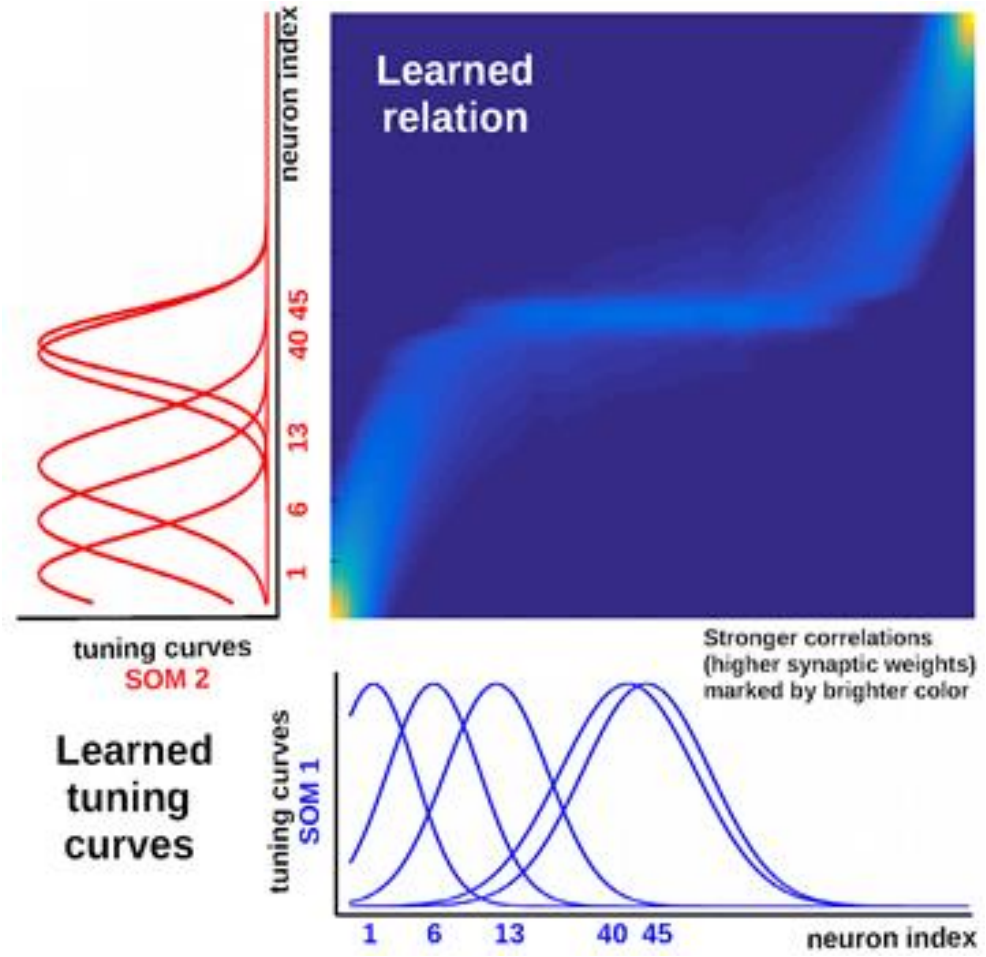
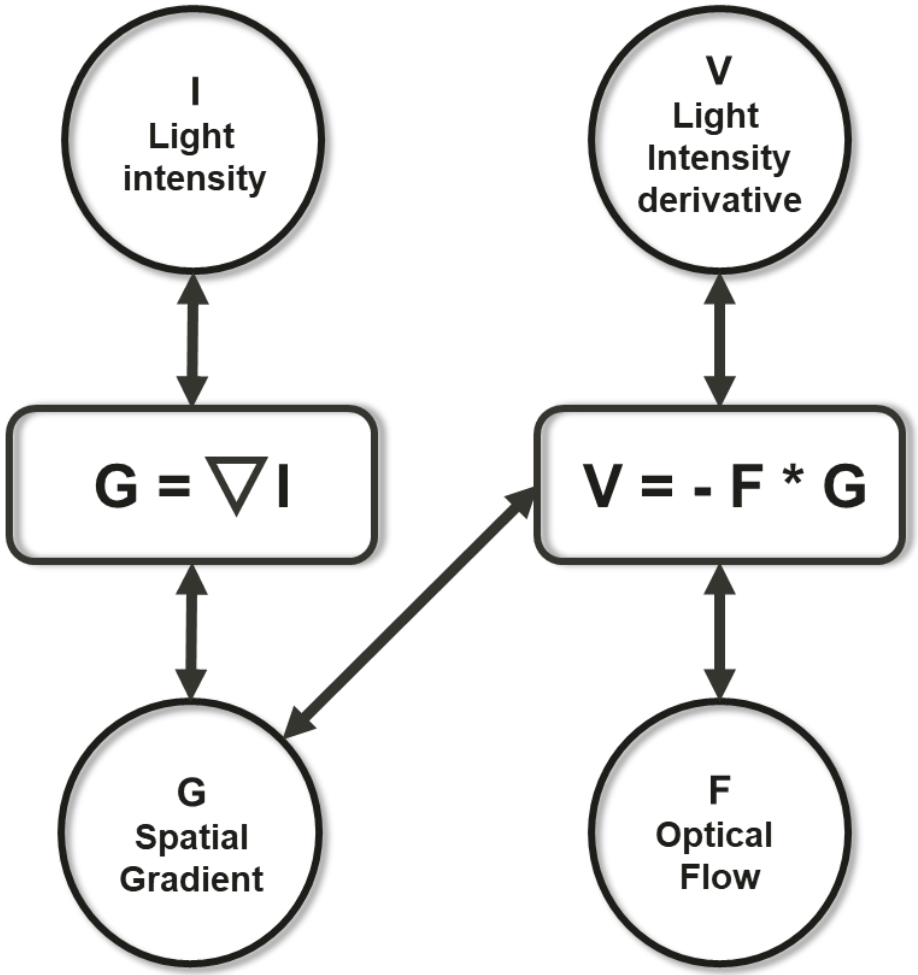


Learning invariants in 1D



Learning invariants in high-dimensional visual scenes

Learning visual scenes



Learning spatial gradient and optic flow

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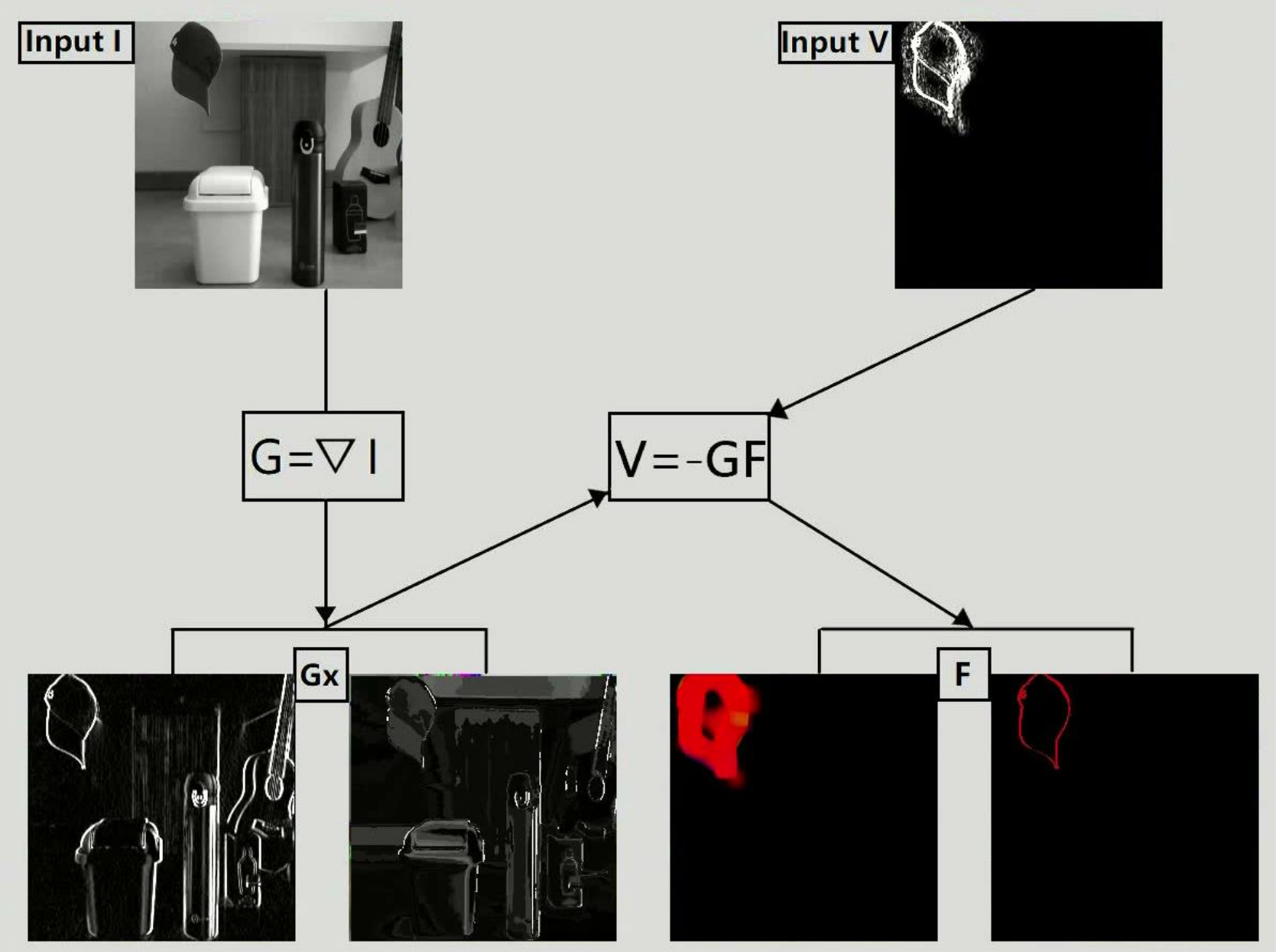

Training

Learning spatial gradient and optic flow

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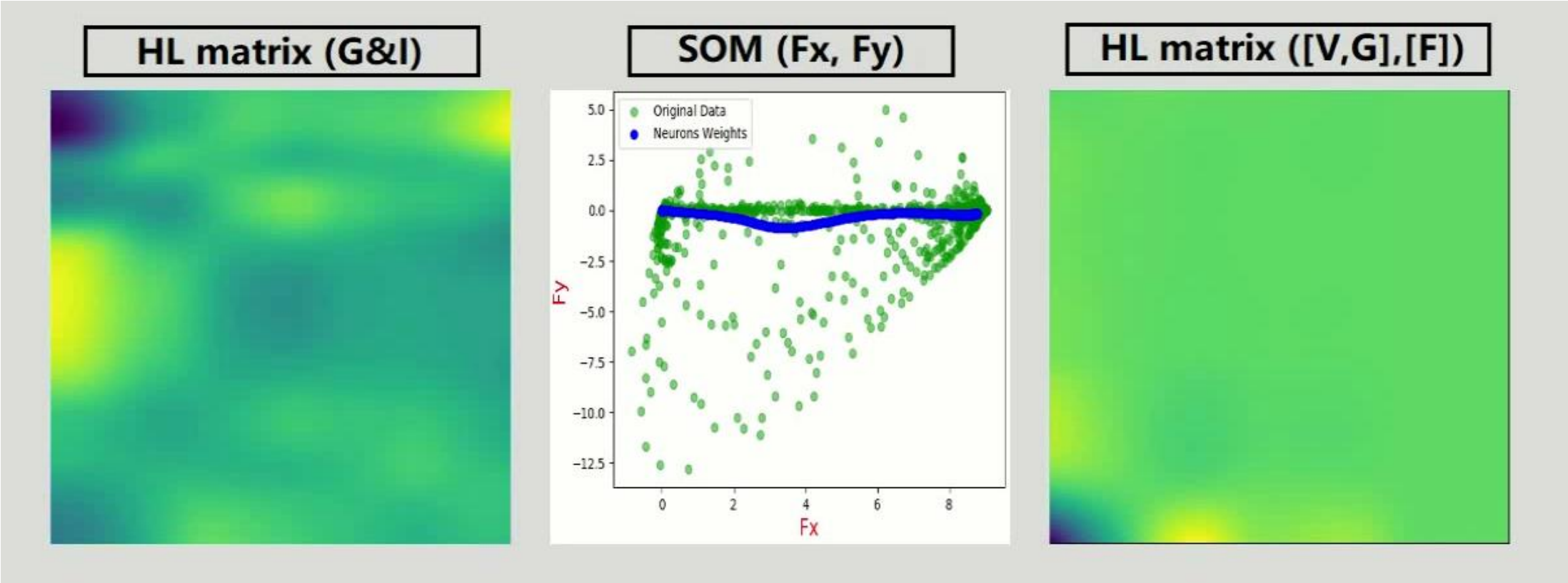
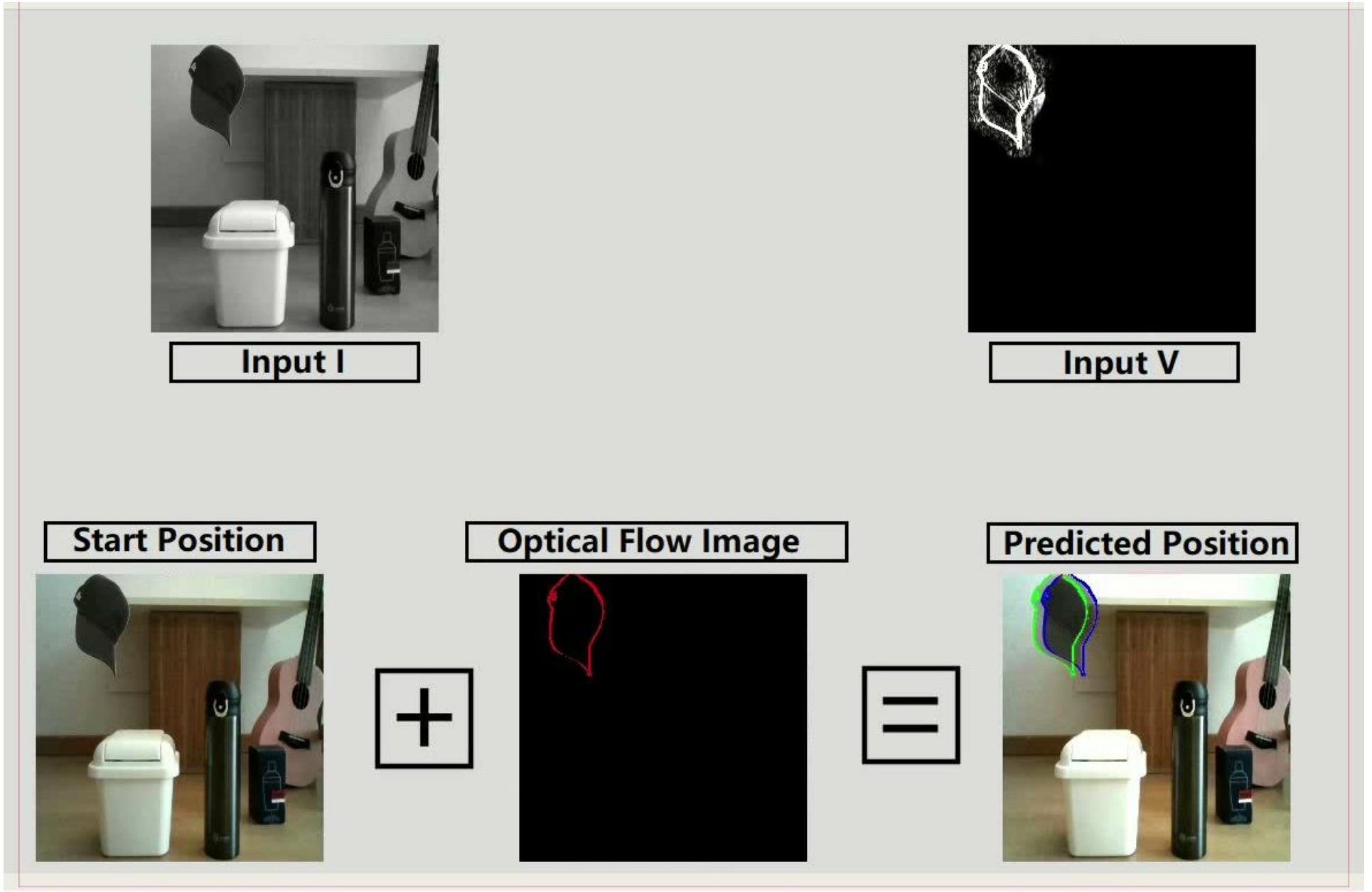


Learning spatial gradient and optic flow



Inference

Learning semantics in the visual scene

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Clustering and classification intrinsically in the system (SOM clustering)

Learning semantics in the visual scene

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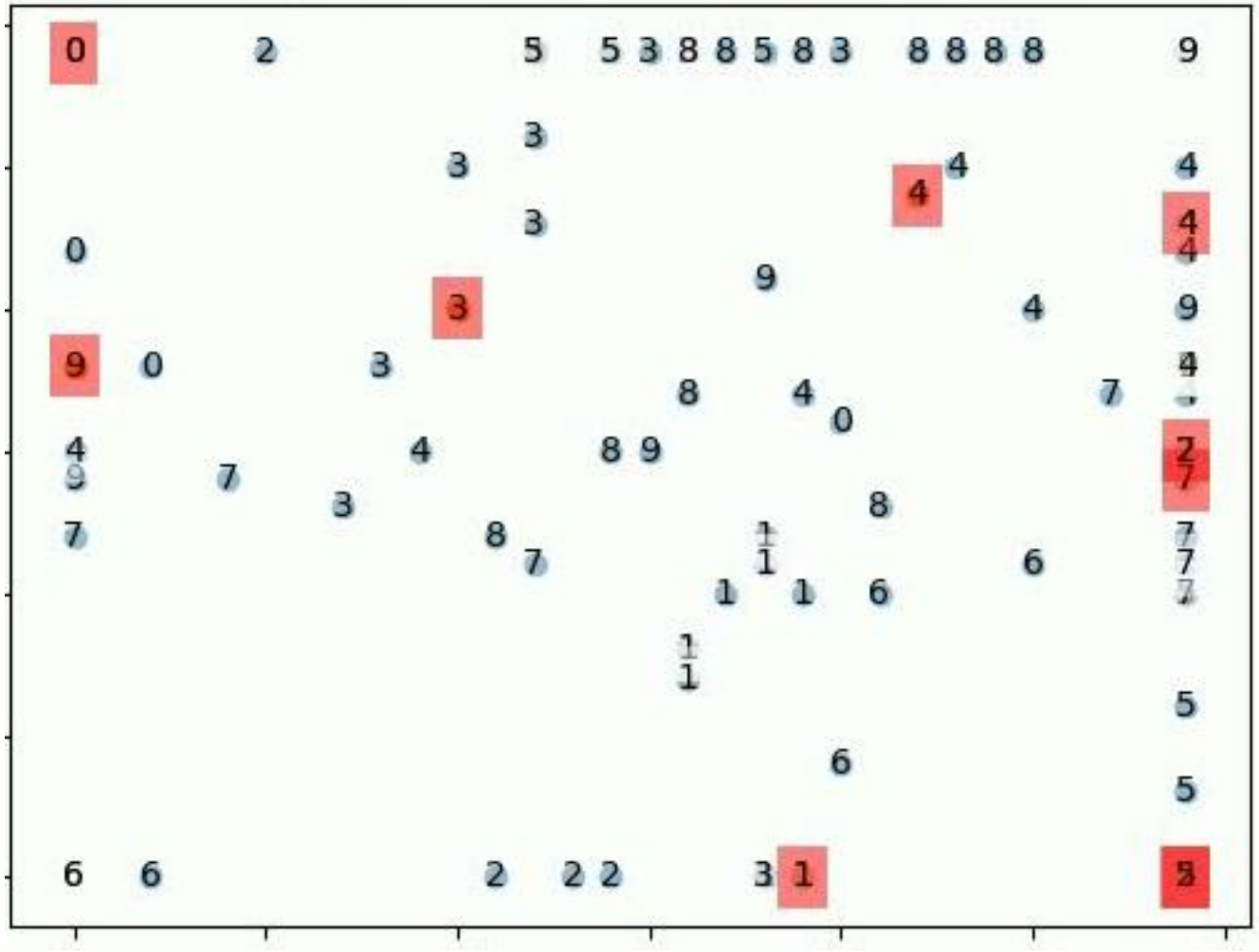
Clustering and classification intrinsically in the system (SOM classification)



Next steps: Learning full rich 3D visual scenes

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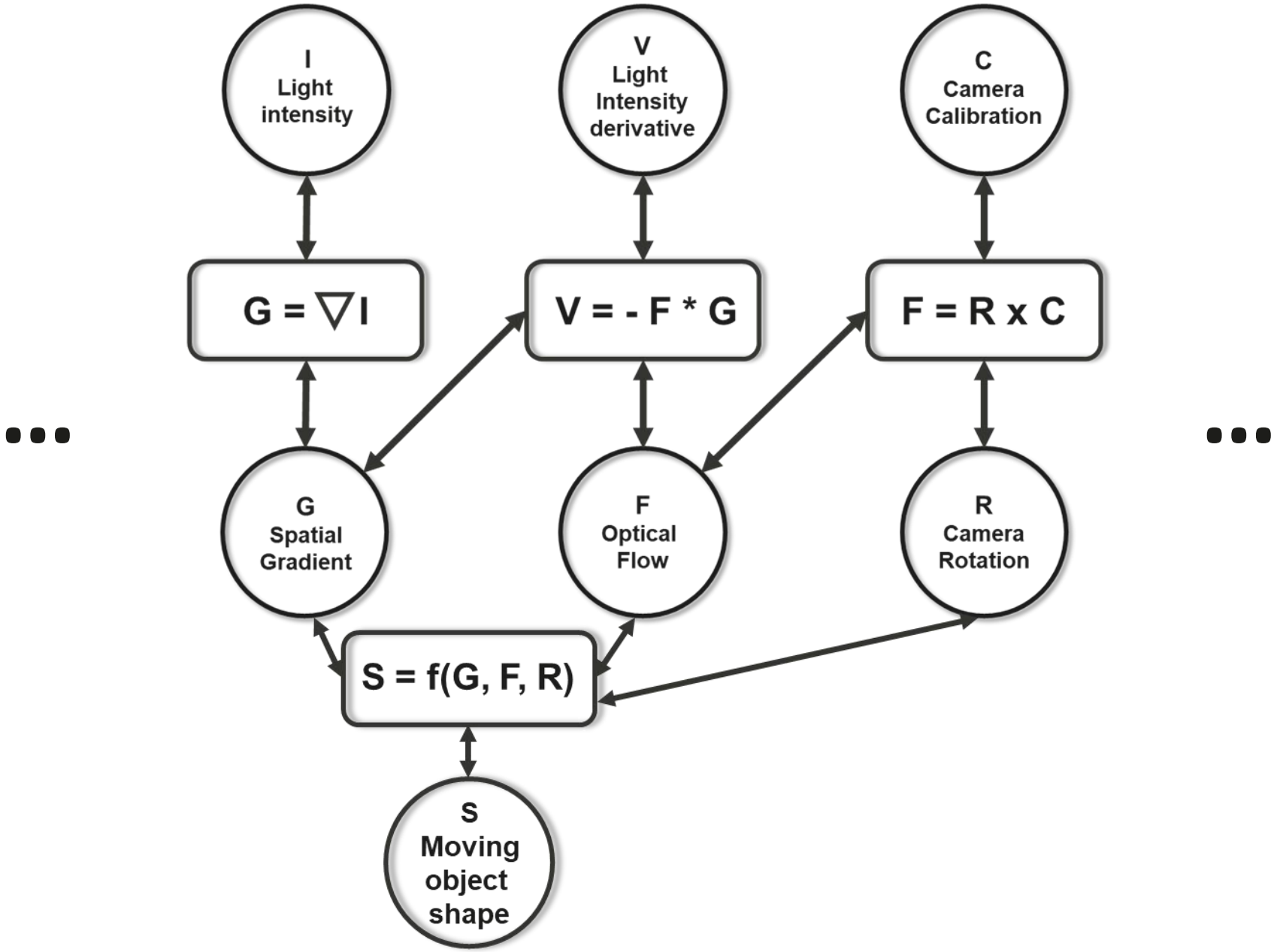

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