



Learning Graph Convolutional Network for Skeleton-based Human Action Recognition by Neural Searching

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CONTENT



PROBLEM



METHOD



EVALUATION

A decorative network diagram in the top-left corner, featuring a complex web of interconnected nodes and lines, with some nodes highlighted in blue.

1.

PROBLEM

Let's start with the problem we need to solve

PROBLEM

- Human action recognition from Skeleton data fueled by the Graph Convolutional Network.
- Most GCN methods ignores implicit joint correlations.
- The need of replacing the fixed graph structure with dynamic one.



A decorative network diagram in the top-left corner, featuring a complex web of interconnected nodes and lines. The nodes are represented by small circles, some of which are highlighted with a double-circle outline. The lines are thin and gray, creating a mesh-like structure.

2.

METHOD

Let's continue with the proposed method

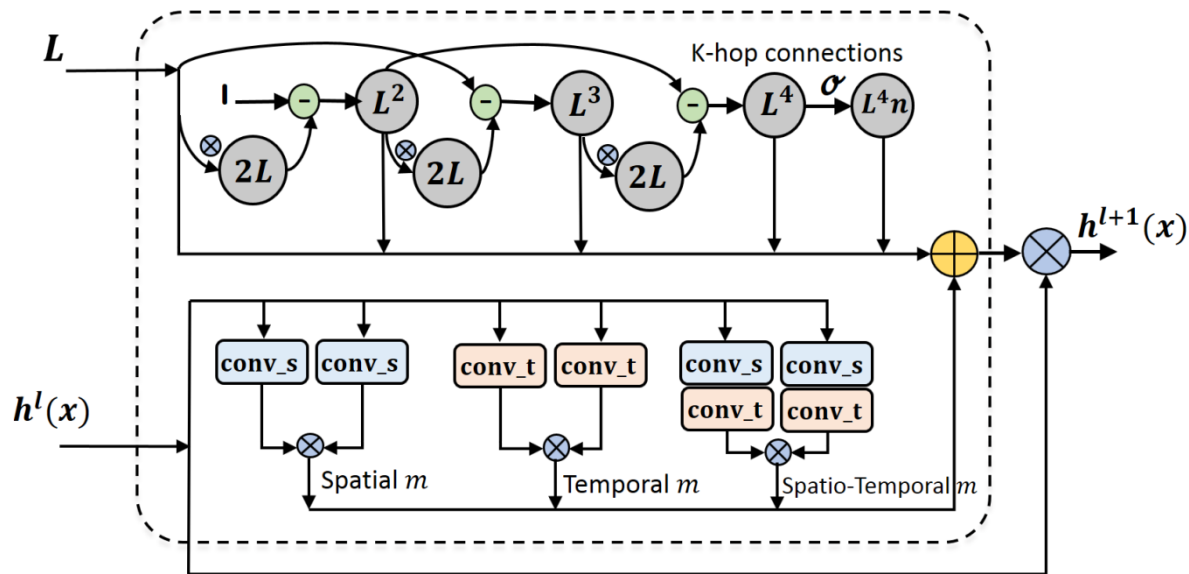
METHOD

- ◎ Using Automatic Neural Architecture Search (NAS)
- ◎ Searching in a GCN space built with multiple graph function modules.
- ◎ Using Search strategy for both sampling and memory efficient.

NAS



METHOD



Chebyshev Polynomials: $T_k(x) = 2xT_{k-1}(x) - T_{k-2}(x)$

SEARCH STRATEGY



A Venn diagram consisting of three overlapping circles with dashed blue borders. The left circle is labeled 'Cross-Entropy', the middle circle is labeled 'CEIM', and the right circle is labeled 'Importance-Mixing'. The circles overlap in pairs and in the center.

Cross-Entropy

CEIM

Importance
-Mixing



3.

EVALUATION

Let's end with the proposed
method evaluation

EVALUATION

Methods	Joint (%)	Bone (%)	Combine (%)
2S-AGCN	93.7	93.2	95.1
T	93.8	93.7	95.1
ST	94.0	93.8	95.2
T+Cheb	94.0	93.9	95.3
ST+Cheb	94.2	93.9	95.3
S+T+ST+Cheb	93.9	93.6	95.1
NAS	94.6	94.7	95.7

Performance Comparison on NTU RGB+D with CV evaluation

EVALUATION

Methods	Top-1(%)	Top-5(%)
P-LSTM	16.4	25.8
ST-GCN	30.7	52.8
AS-GCN	34.8	56.5
2S-AGCN (Joint)	35.1	57.1
2S-AGCN (Bone)	33.3	55.7
2S-AGCN	36.1	58.7
NAS (Joint)	35.5	57.9
NAS (Bone)	34.9	57.1
NAS (Joint+Bone)	37.1	60.1

Performance Comparison on Kinetics with eight current state-of-the-art methods

The background of the slide is a light gray network pattern. It consists of numerous small circles, some of which are solid gray and others are hollow with a gray outline. These circles are interconnected by thin, light gray lines, creating a complex, web-like structure that fills the entire background.

**THANKS FOR
LISTENING!**