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Master in Computer Vision Barcelona

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Xavier Giró-i-Nieto

UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONATECH
Department of Signal Theory and Communications
Image Processing Group

Module 6

Deep Learning for Video: Action Detection

22nd March 2018

Temporal Action Detection

http://activity-net.org/

Temporal Action Detection

Longboarding

Activity Classification

Temporal Action Detection

Longboarding

Activity Temporal Localization

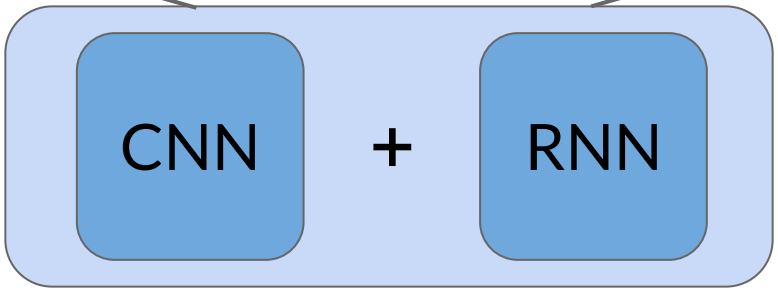
A. Montes, Salvador, A., Pascual-deLaPuente, S., and Giró-i-Nieto, X., "Temporal Activity Detection in Untrimmed Videos with Recurrent Neural Networks", *NIPS Workshop 2016* **(best poster award)**

Temporal Action Detection

Neural Network

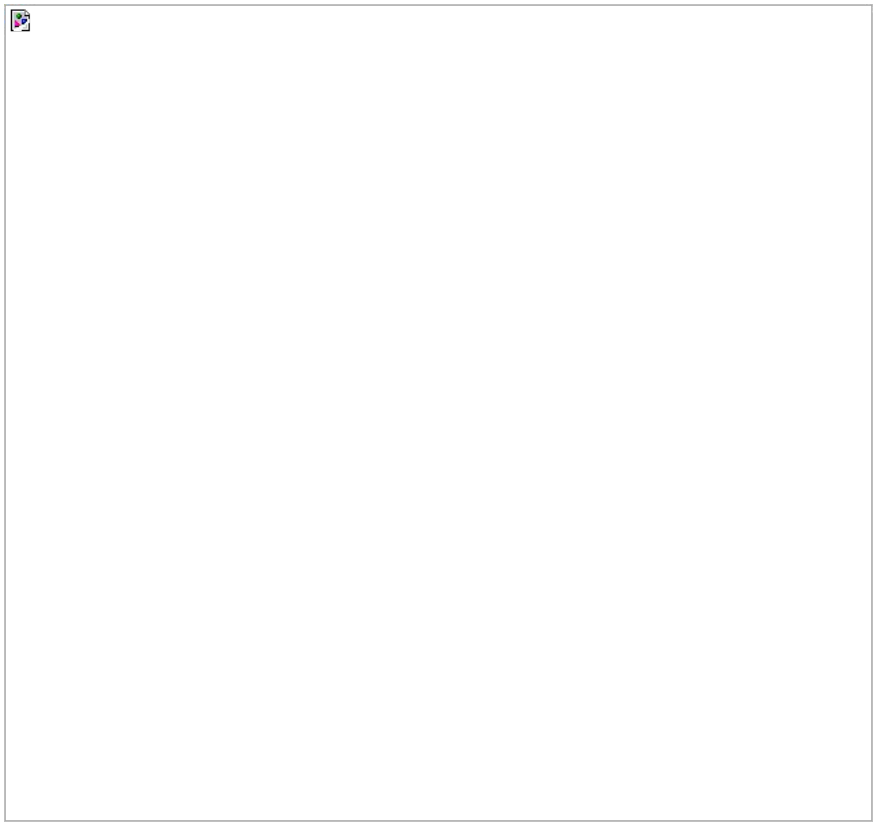
Activity

Temporal Action Detection



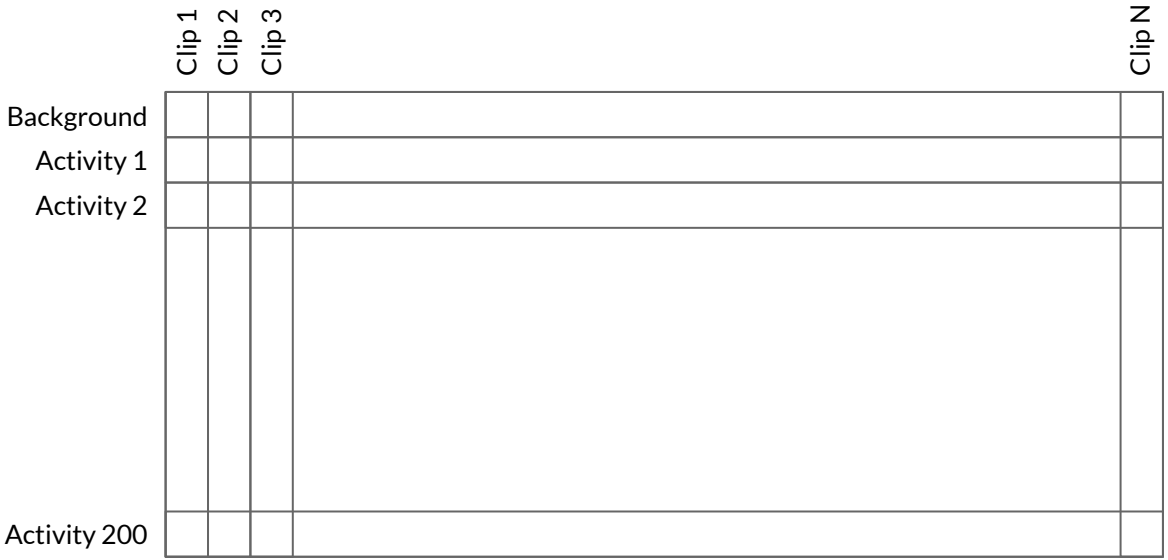
Activity

Action Detection: C3D + LSTM



Alberto Montes, Amaia Salvador, Santiago Pascual, and Xavier Giro-i-Nieto. "Temporal Activity Detection in Untrimmed Videos with Recurrent Neural Networks." NIPS Workshop 2016 **(best poster award)**

Action Detection: C3D + LSTM



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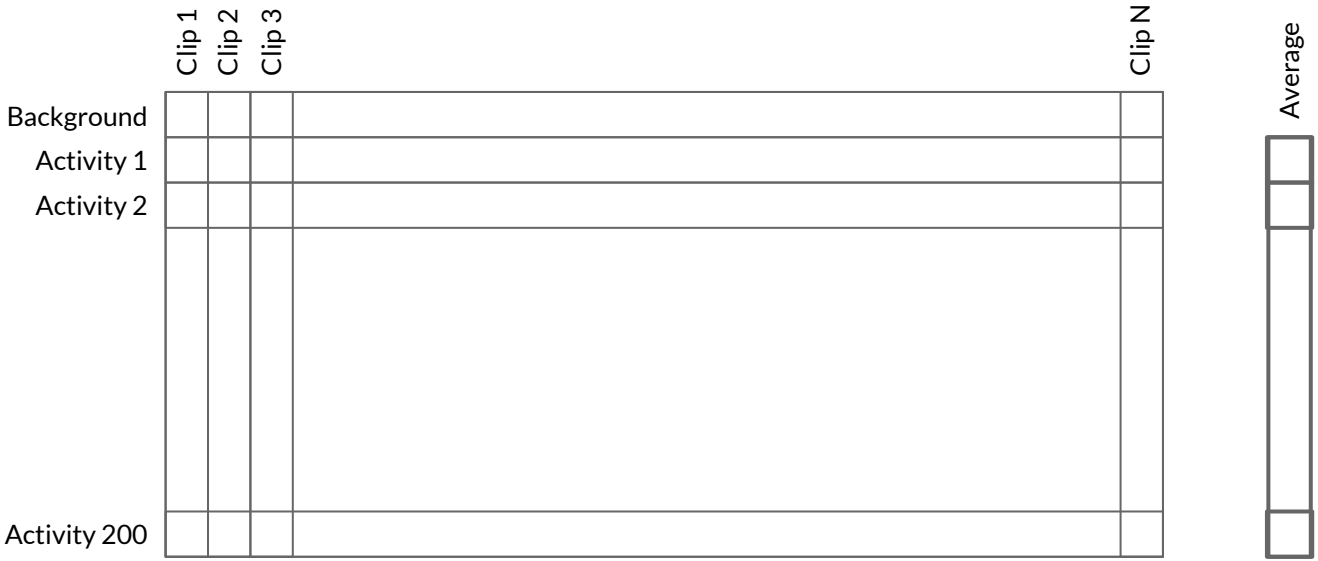

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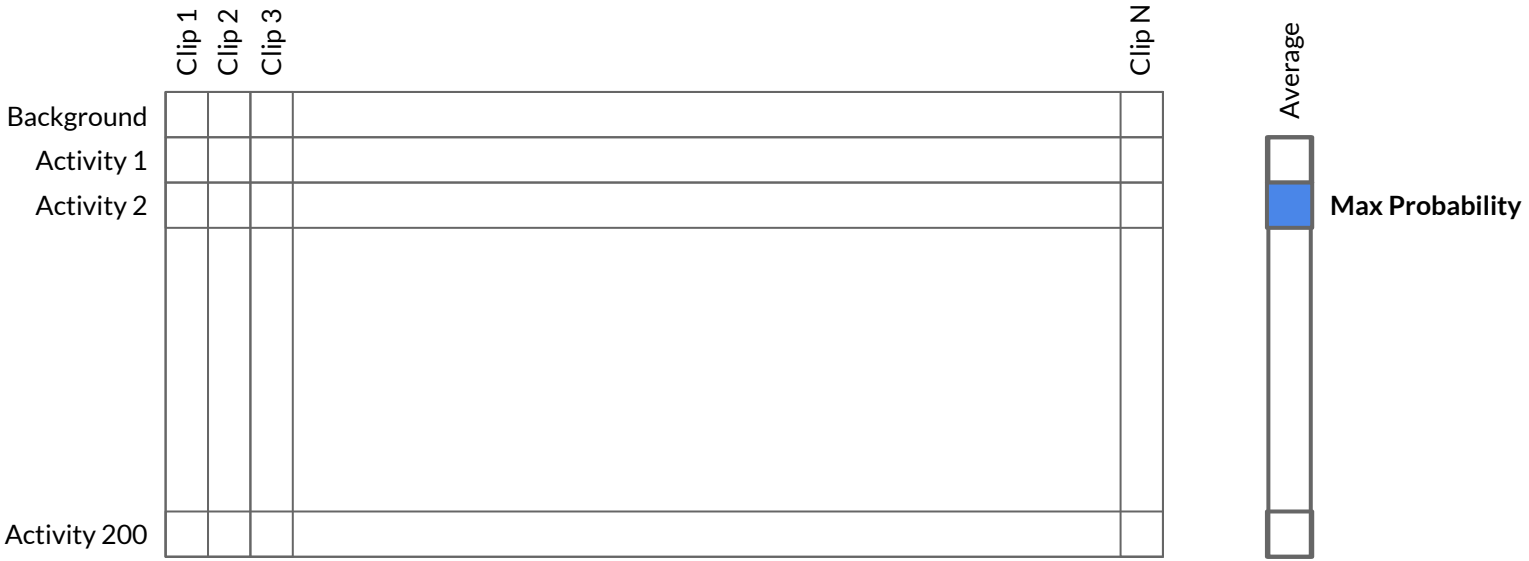

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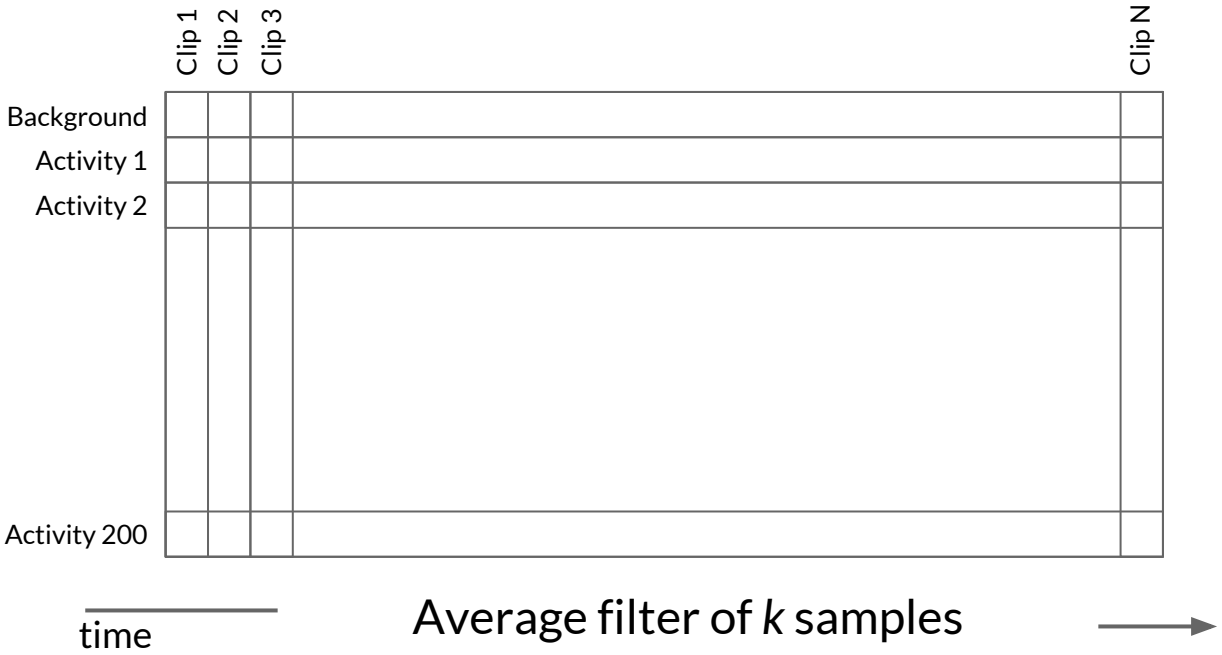

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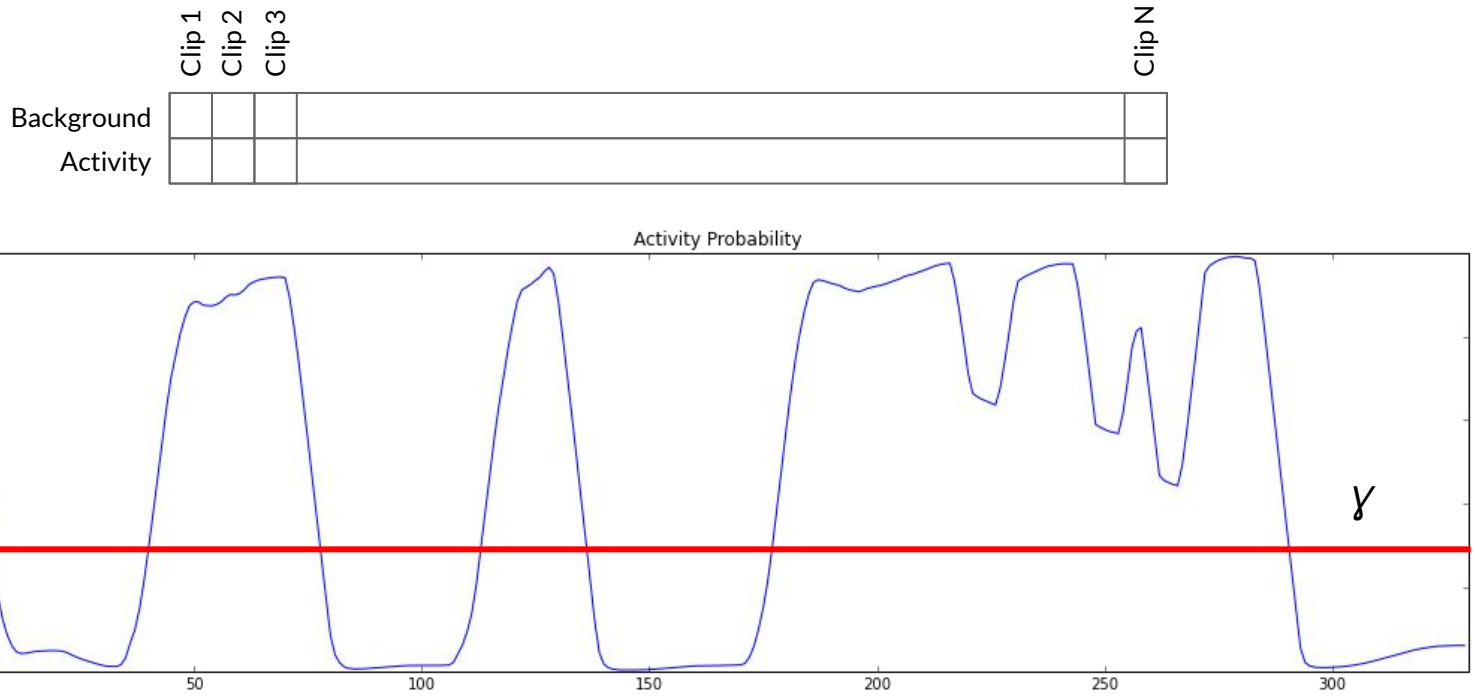

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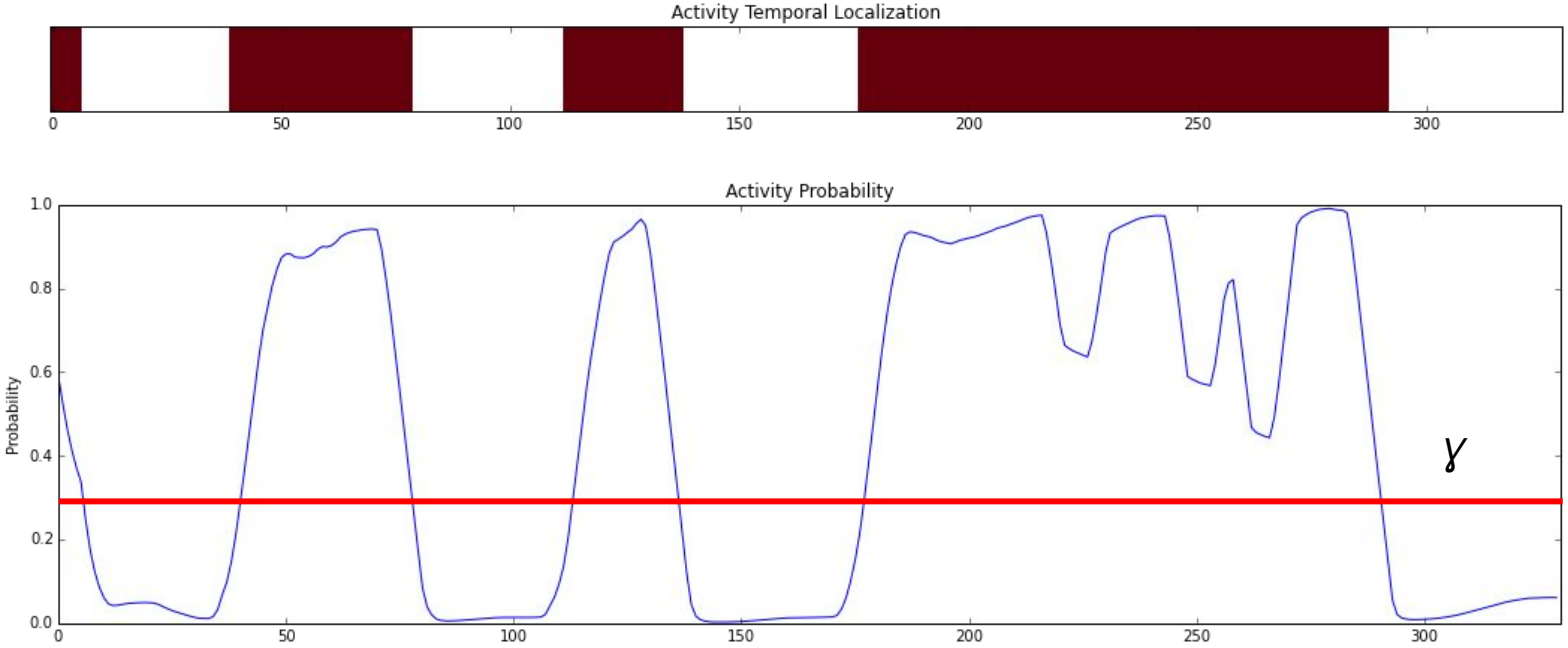

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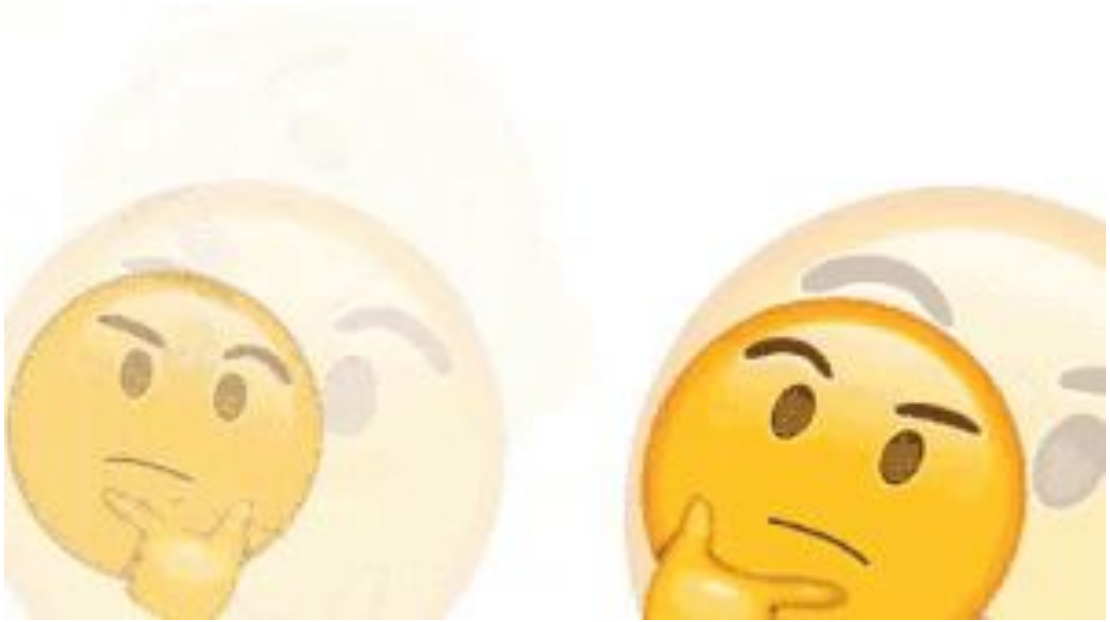
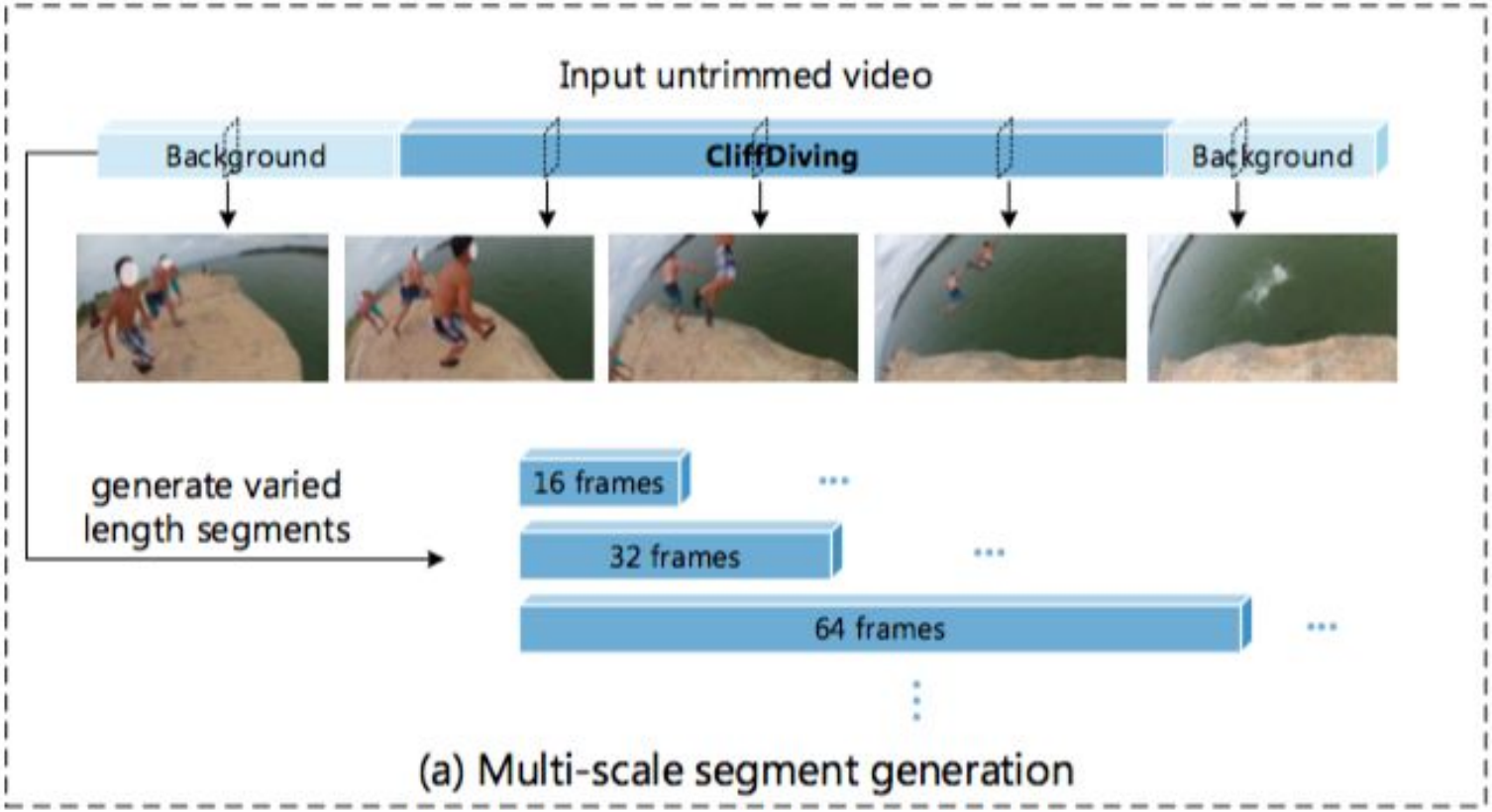
What techniques are used for object detection in images ?



Action Detection: Proposals



Shou, Zheng, Dongang Wang, and Shih-Fu Chang. "Temporal action localization in untrimmed videos via multi-stage cnns." CVPR 2016. (Slidecast and Slides by Alberto Montes)

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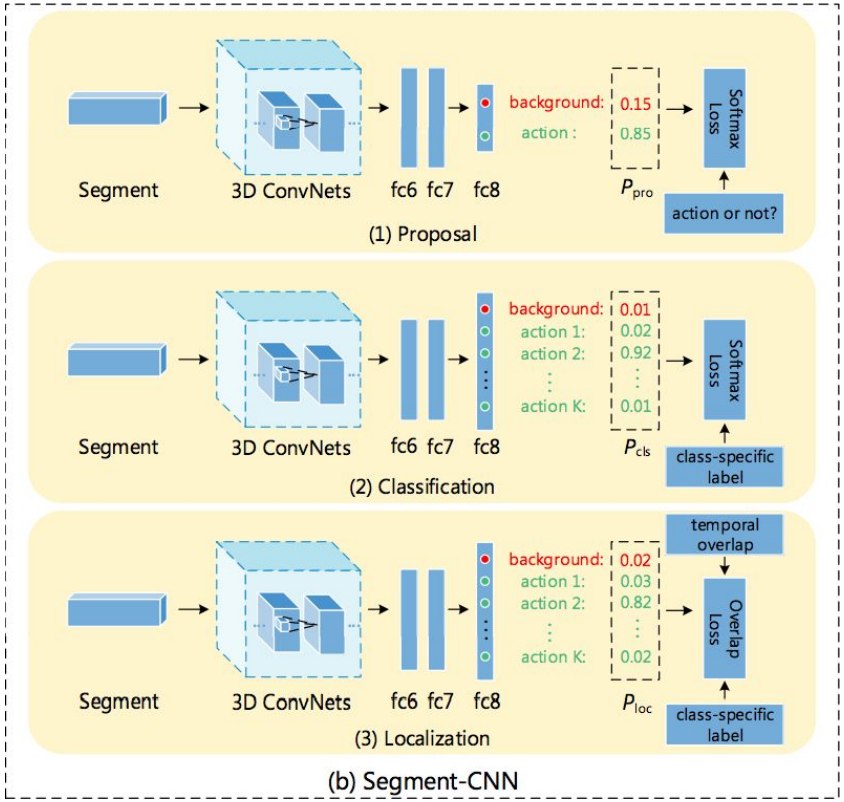

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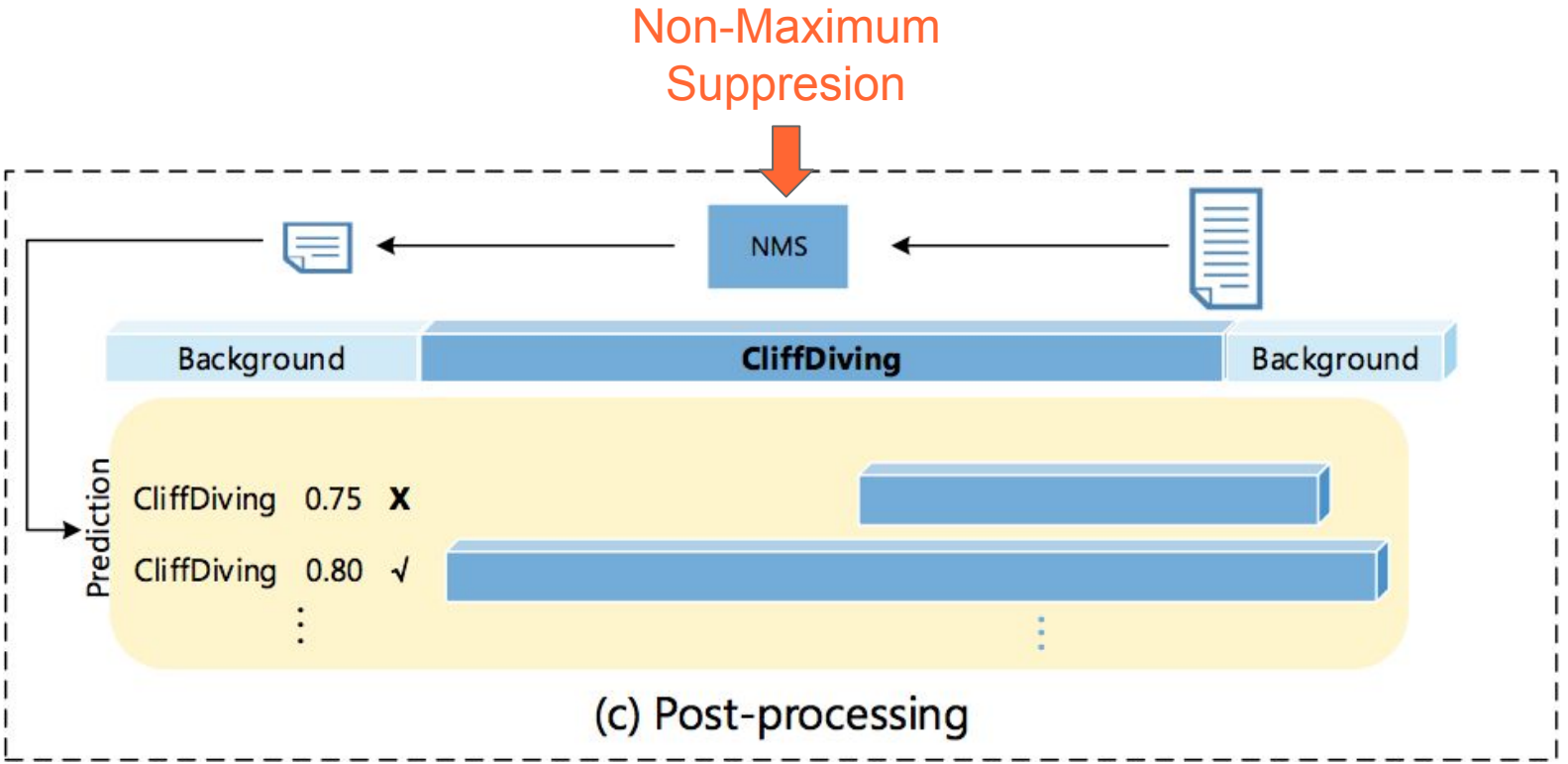

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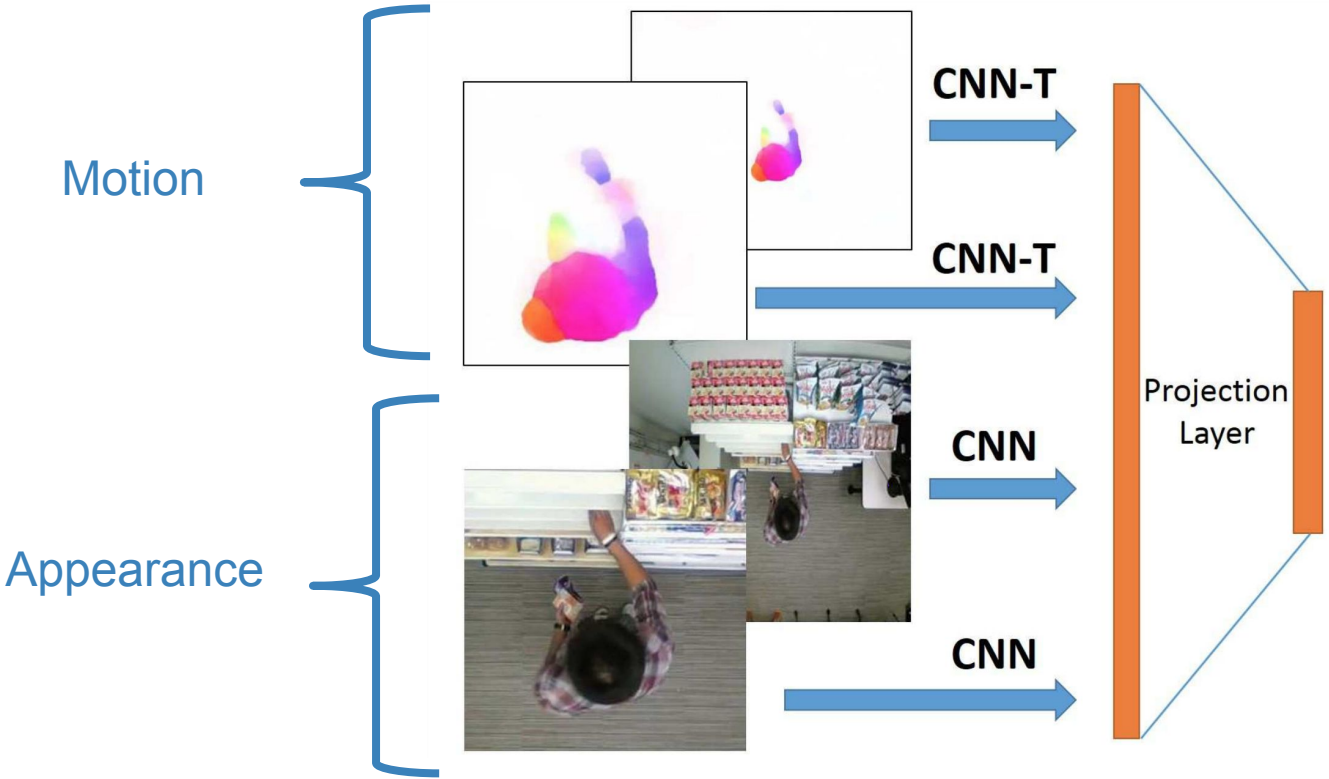
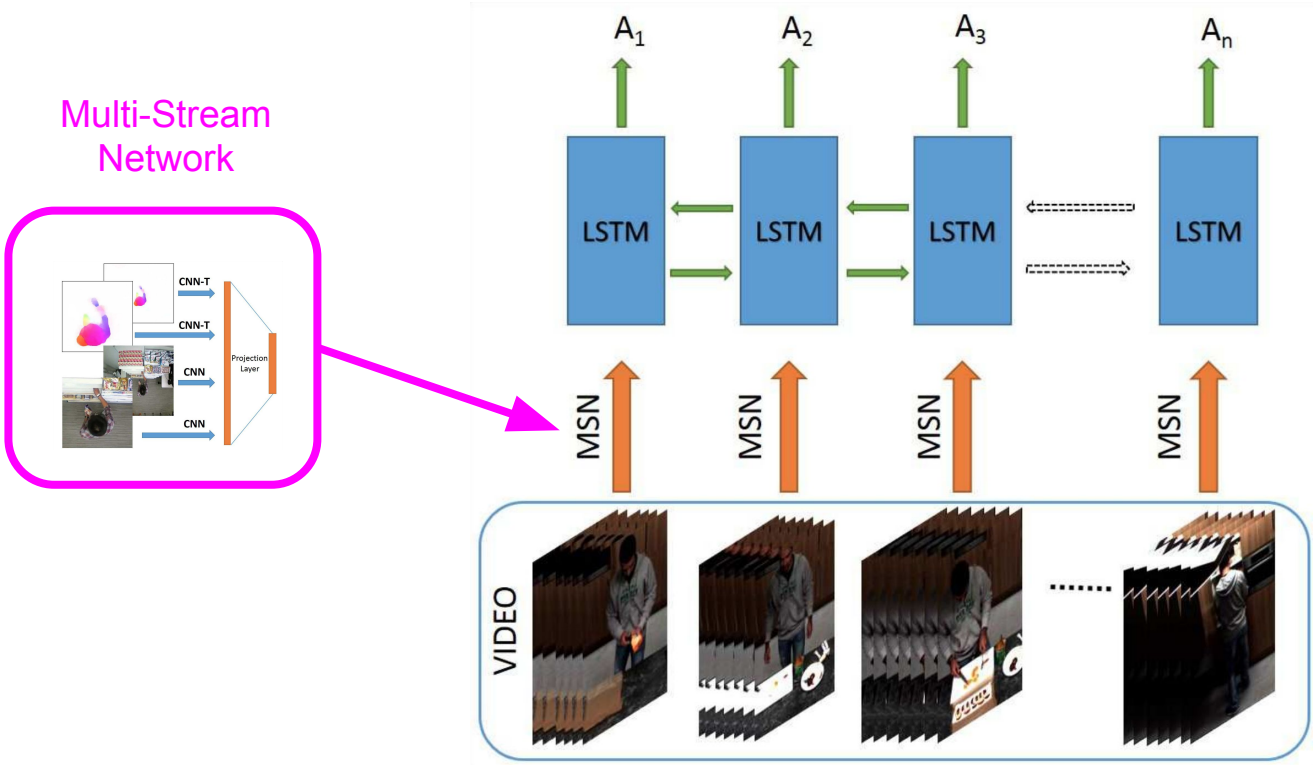
Action Detection: Two-stream CNN + RNN



Singh, Bharat, Tim K. Marks, Michael Jones, Oncel Tuzel, and Ming Shao. "A multi-stream bi-directional recurrent neural network for fine-grained action detection." CVPR 2016

Action Detection: Two-stream CNN + RNN



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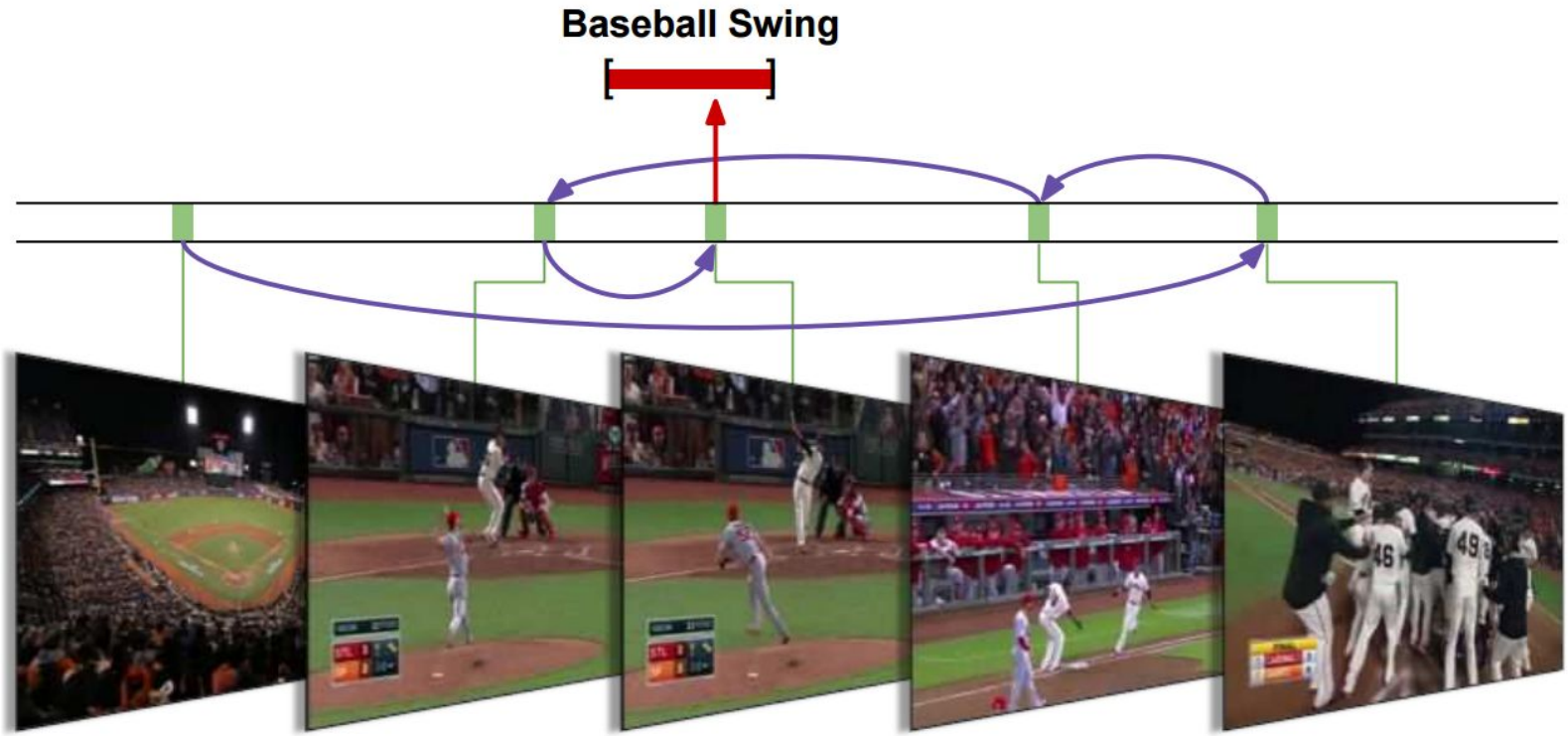
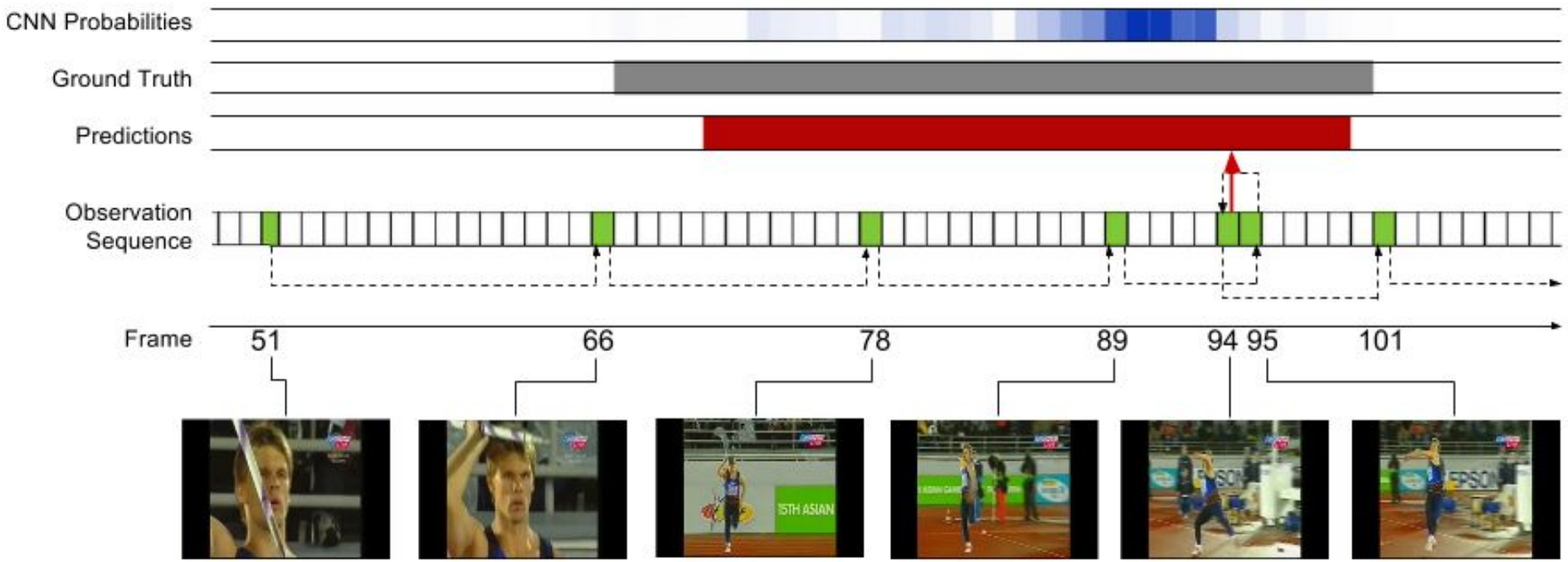
Action Detection: Reinforcement Learning



Yeung, Serena, Olga Russakovsky, Greg Mori, and Li Fei-Fei. "End-to-end Learning of Action Detection from Frame Glimpses in Videos." *CVPR 2016*

Action Detection: Reinforcement Learning



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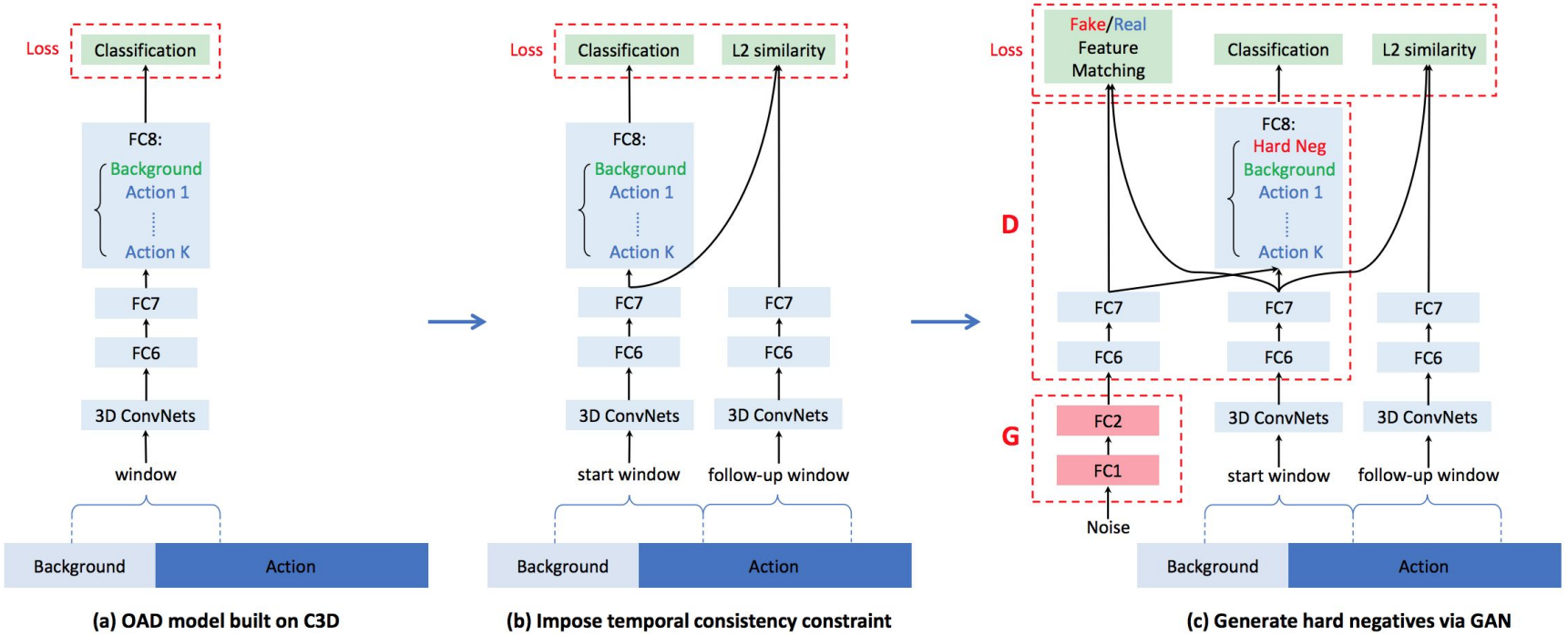
Action Detection: Online



Shou, Zheng, Junting Pan, Jonathan Chan, Kazuyuki Miyazawa, Hassan Mansour, Anthony Vetro, Xavier Giro-i-Nieto, and Shih-Fu Chang. "Online Action Detection in Untrimmed, Streaming Videos-Modeling and Evaluation." arXiv preprint arXiv:1802.06822 (2018).

Deep Learning online courses by UPC:

- [MSc course](#) (2017)
- [BSc course](#) (2018)

Next edition Autumn 2018

- [1st edition](#) (2016)
- [2nd edition](#) (2017)
- [3rd edition](#) (2018)

Summer School (late June 2018)

- [1st edition](#) (2017)
- [2nd edition](#) (2018)

Next edition Winter/Spring 2019