



Automatic Pain Detection in Faces Using Computer Vision and Deep Learning

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Course:

R&D Project (TIENPRAU) Q3'15
5 ECTS-Points

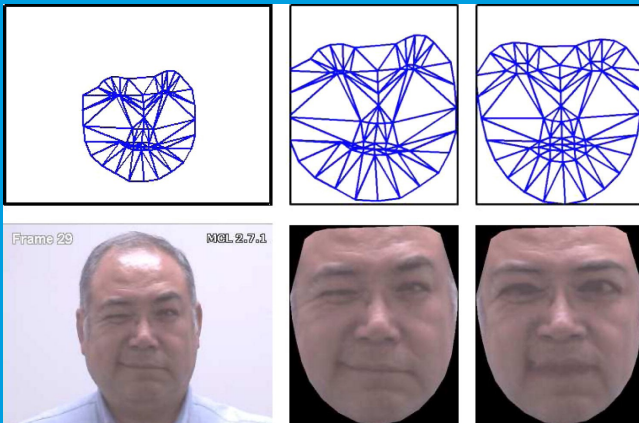
Tags: Pain Recognition, Computer Vision, SVM, Deep Learning, Convolutional Neural Networks

Purpose:

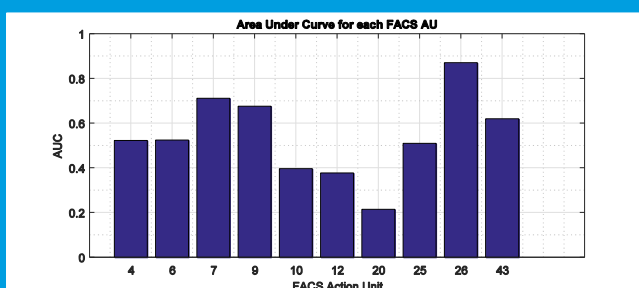
- Research state-of-the-art in facial Pain Recognition
- Reproduce previous results with classical CV/ML methods
- Apply Deep Learning

Classical Method:

- Use facial landmark the to extract facial appearance and shape
- Warp appearance to mean shape



- Train SVM to detect:
 - FACS Action Units
 - Pain (from PSPI-score)



- Issues:
 - Distortion & Artifacts



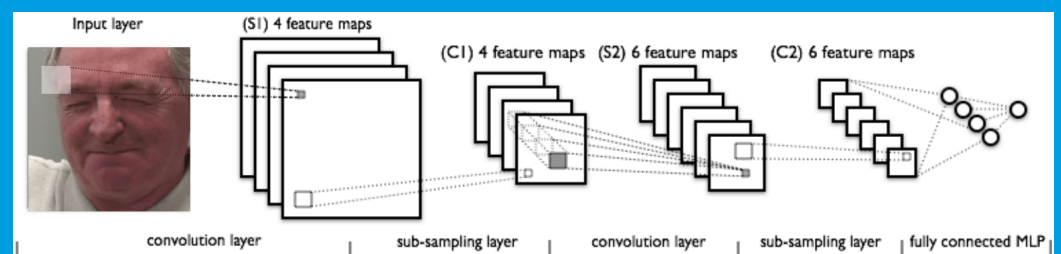
Data:

- UNBC-McMaster Shoulder Pain Expression Database
- Sequences of images of subjects with shoulder injuries moving their arm (48398 images in total)
- Frame level facial registration and pain estimate data



Convolutional Neural Network Method:

- MatConvNet CNN toolbox for MATLAB (VLfeat.org)
- Extract face patches with Viola-Jones face detector



- Results for leave-one-subject-out validation:

