

Pain Recognition Using Video-Based Facial Features

- Pain assessment is normally based on self-reporting due to the subjective nature of feeling or experiencing pain. However, subjective measures are difficult to quantify and scale up. In this project, we will develop regression and classification algorithms to demonstrate the feasibility to derive pain intensity using features extracted from face videos.
- **What Students Will Do:**
 - Process Shoulder-Pain dataset
 - Tune ordinal support vector regression (OSVR, CVPR'16)
 - Replicate experiments
 - Improve OSVR with a hypothesis
 - Test the hypothesis
 - Accept or reject the hypothesis
- **Size group:** 1-2
- **Skills:** MATLAB, Python (optional), machine learning (optional)
- **Mentors:**
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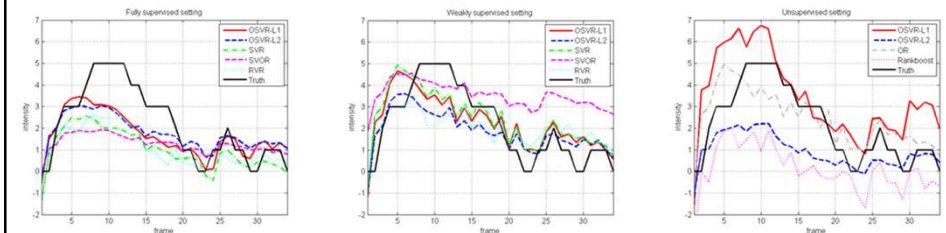
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- **Deliverables:** short description or bullets
 - Process Shoulder-Pain dataset
 - Provided: raw data (possibly with a few starter scripts)
 - Expected: processed data in required formats
 - Tune ordinal support vector regression (OSVR, CVPR'16)
 - Provided: algorithm sketch and demo program
 - Expected: executable with source and readme
 - Replicate experiments
 - Provided: (fully, weakly-, un-)supervised setting
 - Expected: evaluation and analysis (see next page)
 - Improve OSVR with a hypothesis
 - Provided: possibly a basic idea
 - Expected: a concrete short proposal in written form
 - Test the hypothesis
 - Expected: evaluation and analysis in written form
 - Accept or reject the hypothesis.
 - Expected: a presentation with reasoning



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Setting	Method	PCC	ICC	MAE
Fully supervised	KCORF _h [23]	N/A	0.7030	0.8000
	csCORF _{wh} [24]	N/A	0.6400	0.8200
	SVR [27]	0.5659	0.5045	0.8538
	SVOR [3]	0.5483	0.3726	0.9366
	RVR[13]	0.5749	0.5036	0.8687
	OSVR-L1	0.5999	0.5593	1.0252
Weakly supervised	OSVR-L2	0.6014	0.5335	0.8095
	SVR [27]	0.4766	0.4511	1.3895
	SVOR [3]	0.5051	0.4240	2.9801
	RVR[13]	0.4823	0.4365	1.1122
	OSVR-L1	0.4981	0.4710	1.1512
	OSVR-L2	0.5441	0.4955	0.9519
Unsupervised	Rankboost[31]	0.4341	0.3718	1.0609
	OR [10]	0.4572	0.4279	2.0903
	OSVR-L1	0.4921	0.4020	2.6399
	OSVR-L2	0.5101	0.4108	1.1180



3 600.446/646 CIS2 Spring 2017
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