Report Meeting Week 9
Benjamin Mears

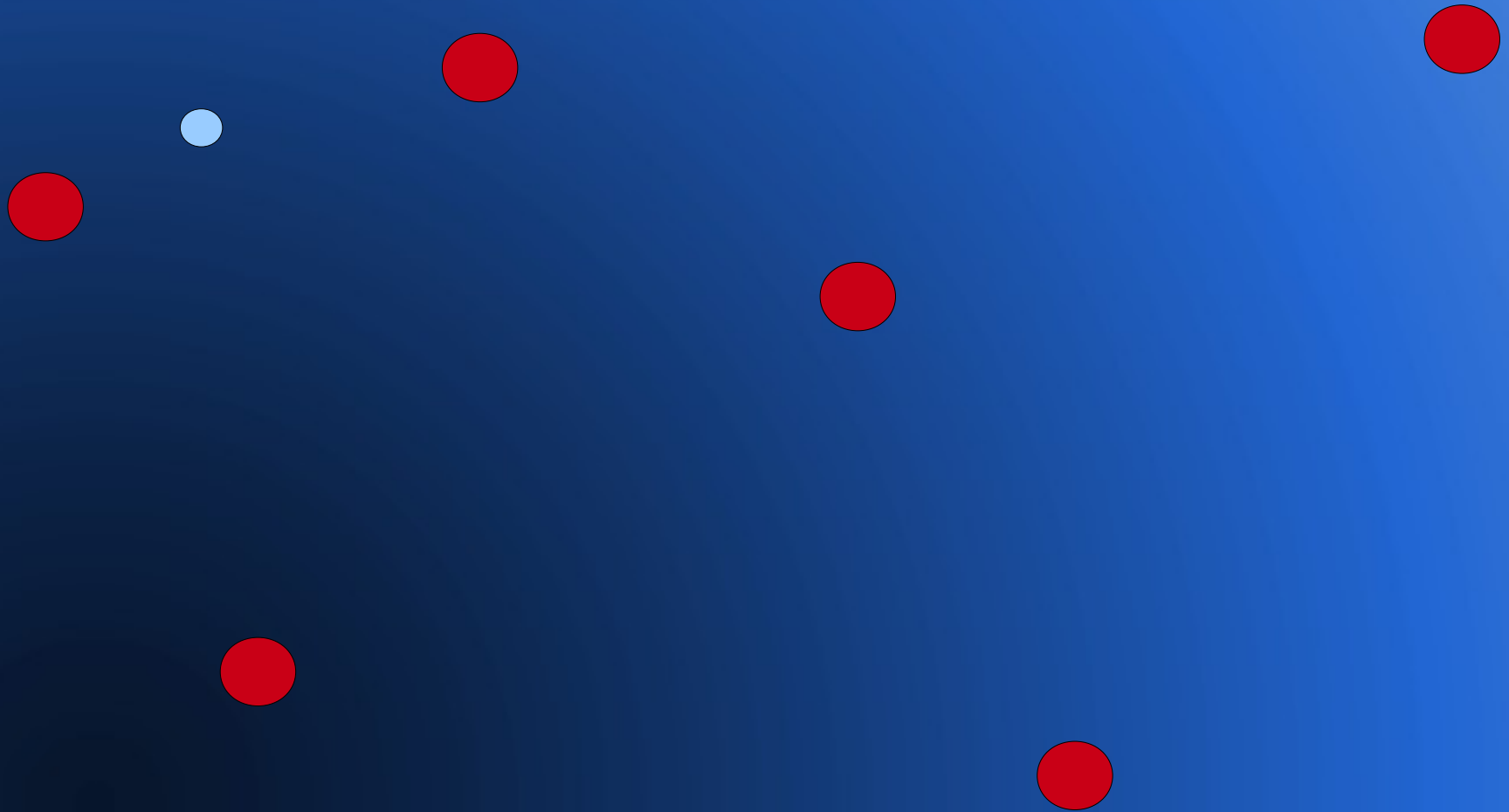# TRECVID High Level Feature Extraction

Optical Flow

- This week

  - Finished with optical flow experiments

  - Word-weighting techniques

  - Finally figured out built-in LIBSVM histogram intersection kernel

    - MUCH faster!

Optical Flow

- Experimented with different number of bins/incorporating magnitude information

- Results did not appear promising

- Computation time considerations
  - ~300,000 Keyframes @ ~10 sec each
    - 34 Days!

Soft-Weighting of Words

Soft Weighting Of Words

$$t_k = \sum_{i=1}^{4} \sum_{j=1}^{M_i} \frac{1}{2^{i-1}} sim(w,j)$$

$$sim(w,j) = \frac{1}{\log(dist(w,j))}$$

"Towards Optimal Bag-of-Features for Object Categorization and Semantic Video Retrieval"

IRISA, Y. Jiang, C. Ngo, J. Yang

Weighting Words

$$weight(i) = \left(\overline{tf_i} \log \left(\frac{N}{df_i} \right) \right)^2$$

$N = \#$ of images

$df_i = \#$ of images containing word t_i

$\overline{tf_i} =$ Average occurence of word t_i in documents containing t_i

"A review of weighting schemes for bag of visual words image retrieval" Tirilly, et al (City Univeristy of Hong Kong and Carnegie Mellon University)

	Baseline			Soft Weighting With (Mean-TF-IDF)^2		
	PD	PFA	Total	PD	PFA	Total
Airplane_flying	75	22.5	76.7	85	25	78.3
Boat_Ship	87.3	24.2	79.6	87.3	21.4	81.5
NightTime	83.5	17.4	82.8	86.2	14.7	85.6
Bus	80	17.5	81.7	75	12.5	83.3
People_dancing	69.4	34.7	66.7	67.4	29.6	69.4
Chair	67.9	25.3	72.4	77.6	20	79.2
Cityscape	77.9	31.2	71.9	76.6	25.3	75.3
Person-eating	52.3	34.6	61.0	46.2	26.9	64.1
Classroom	62	35	64.0	72	25	74
Demonstration_or_protest	74.4	29.5	71.8	71.8	29.5	70.9
Person-Playing-musical-instrument	74	27.1	73.3	75.3	18.5	79.5
Person-playing soccer	73.3	23.3	75.5	66.7	18.3	76.7
doorway	79.5	25.2	76.3	79.5	20.5	79.5
Person-riding-a-bicycle	71.2	31.1	69.7	75.8	26.5	74.2
Singing	76	30.7	71.5	79.2	23.4	77.4
Total:	73.5	26.5		77.1	23.9	

Up Next...

- Start running system on test data ASAP

- Troubleshoot

- Format XML output

- Begin work on notebook paper
  - Continuing Learning LaTex