## **Feature Set Embedding for Incomplete Data – W 13** D. Grangier & I. Melvin **NEC**

Missing Features: examples as sets of (FeatureId, FeatureValue) pairs

• Missing Features

• Prior Art: Examples are vectors

impute integrate out example-specific subspace

• This Work: Examples are sets of (FeatureId, FeatureValue) pairs

 $x = \{(A, 0.15), (E, 0.28), (F, 0.77)\}$ 

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FSE classifies sets of (FeatureId, FeatureValue) pairs



1. *p* embeds each pair (FeatureId, FeatureValue) into a latent space

- 2.  $\Phi$  summarizes the latent vectors into one vector (e.g. average or max)
- 3. V classifies this vector

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Flexibility, Empirical Advantage, Beyond Missing Feat.

- flexibility: *p* allows mixing continuous/discrete features encoding prior knowledge about the features...
- outperform recent alternatives for feat. missing at train time only test time only

 FSE allows prediction before all features are computed multi-instance learning active feature selection

## See you at Poster # 13