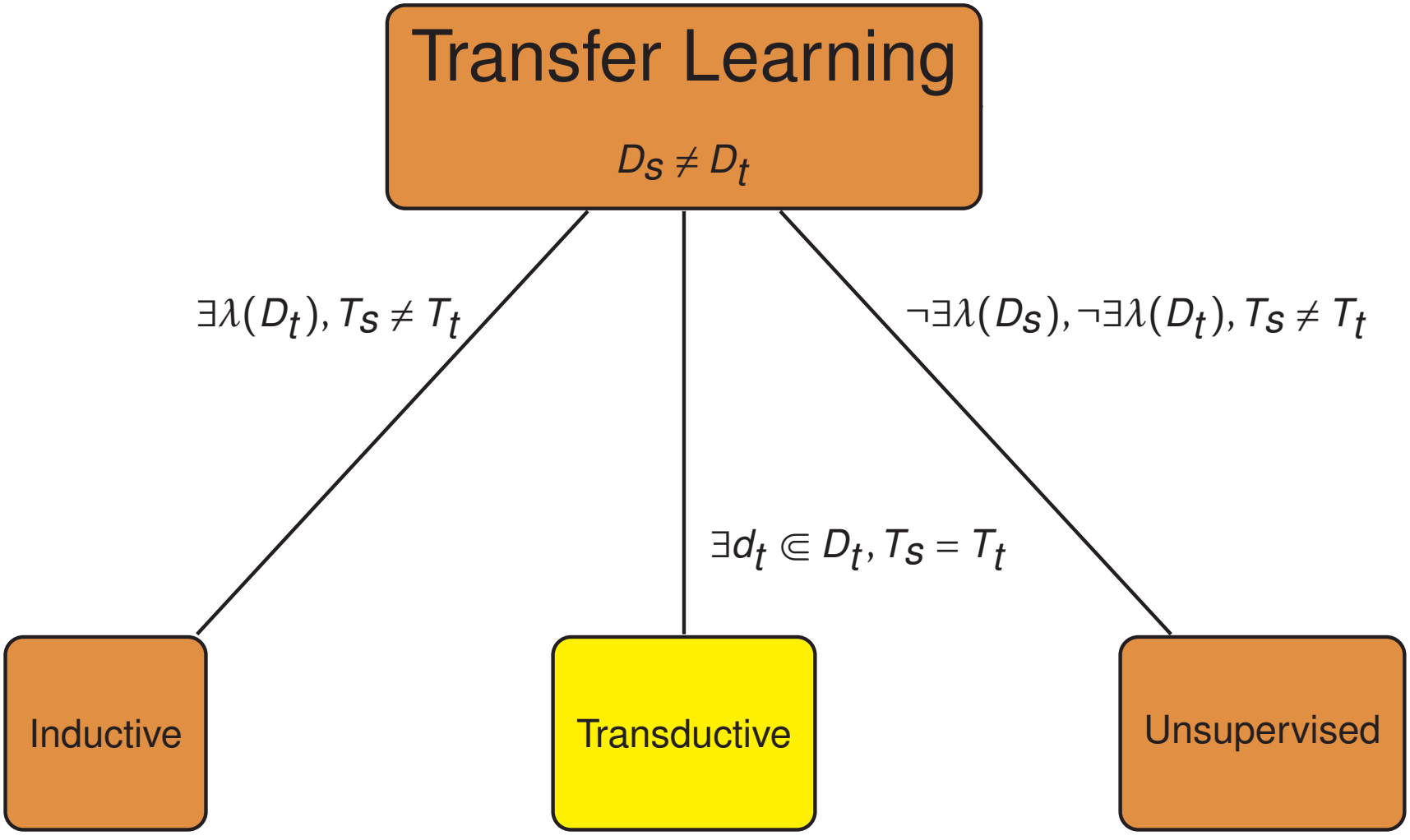
Transfer Learning Taxonomy



Transductive Work

Source and target tasks are the same but the domains are different

- Recognizing spoiled pears after training on apples
- Classifying letters after training on numbers

This is not exactly what we do; we are reusing elements of T_s in T_t, but not the entire task (which would be the entire network with no change).

- *Arnold*; entropy-based IFT; as fast as SVM, not as adaptable
- *Joachims*; TSVMs, better performance, especially on small sets
- *Huang*; non-parametric weight re-sampling between D_s and D_t
- *Sugiyama*; non-density estimation based shift management, better performance
- *Bickel*; Kernel LR classifier with no modeling
- *Dai*; Naive Bayes, good performance, revising model

Transductive Work

- *Blitzer*; SCL Algorithm, feature extraction from D_t; uses pivots, which require domain expertise; may be able to use mutual information for selection though (MI-SCL)
- *Daumé*; Kernel mapping NLP into high-dimensional feature space; train classifiers here; kernel function is domain driven
- *Dai*; co-clustering, good classification performance
- *Xing*; bridged refinement uses a mixture of training and test data to bridge a classifier from $D_s \rightarrow D_t$
- *Ling*; Spectral classifier objective function seeks consistency between D_s and D_t
- *Xue*; Text classifier extends PLSA integrating labeled and unlabeled data from different domains
- *Pan*; uses MMDE in low-dimensional spaces, but computationally intense
- *Pan*; TCA works in same domain as MMDE but better claimed performance

More Neurally Focused