

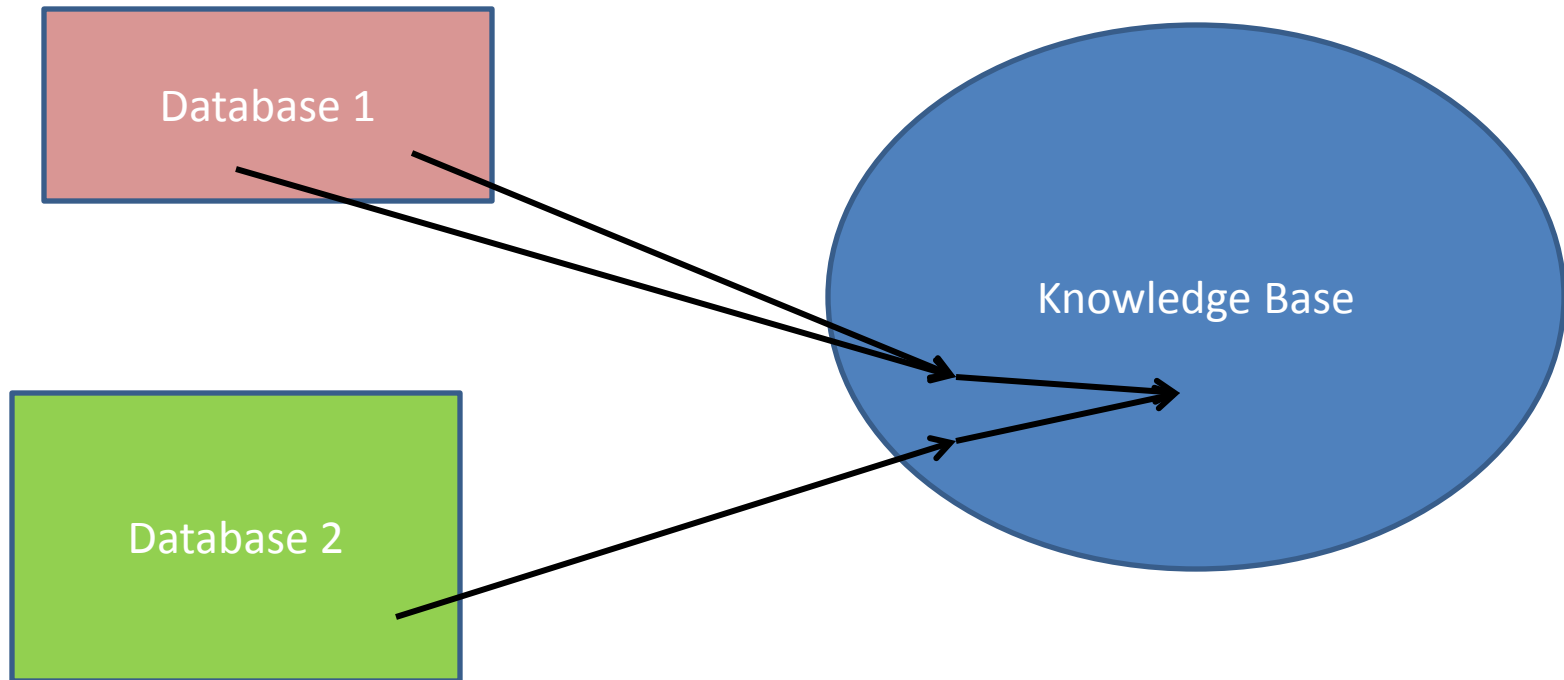
Augmenting Medical Databases with Domain Knowledge

John Aronis

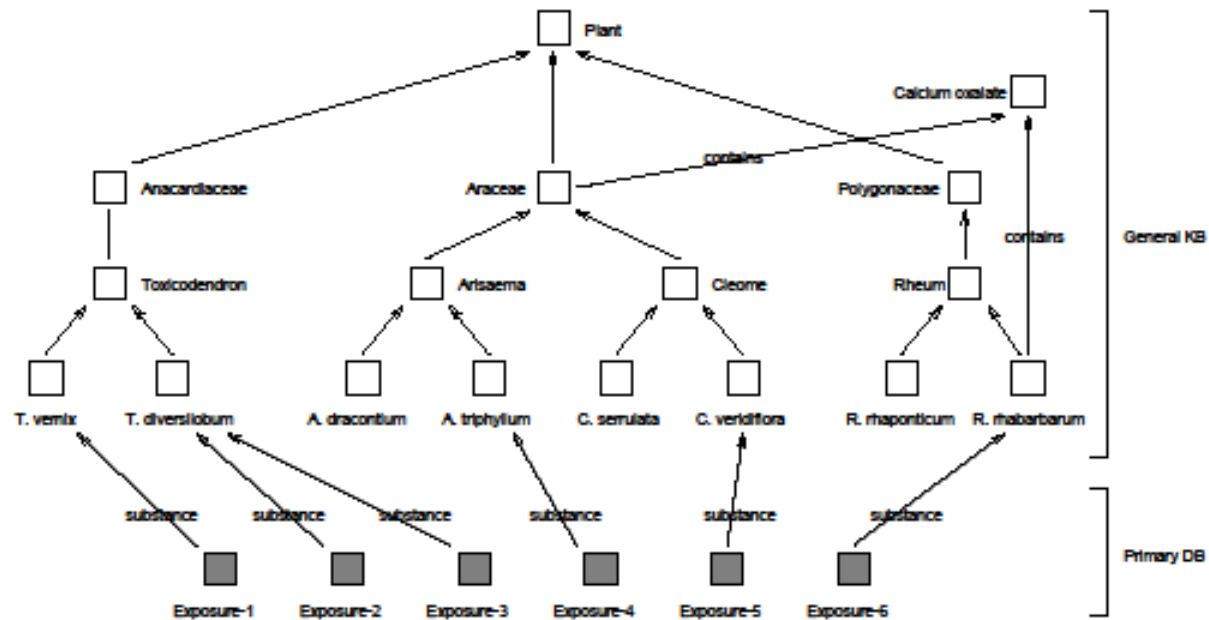
“Knowledge Is Good” (Faber College Motto)

- Categories and relations explain observations.
- Taxonomies direct learning and exploration.
- Categories enable induction.
- Scripts and frames organize facts.

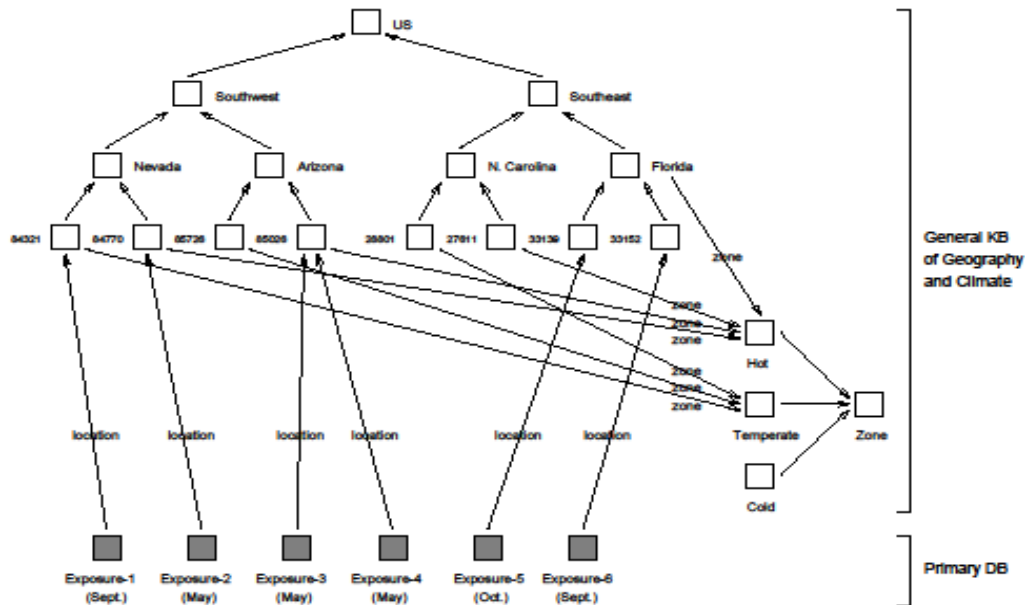
Connecting Data and Knowledge



A Combined Data-Knowledge Base

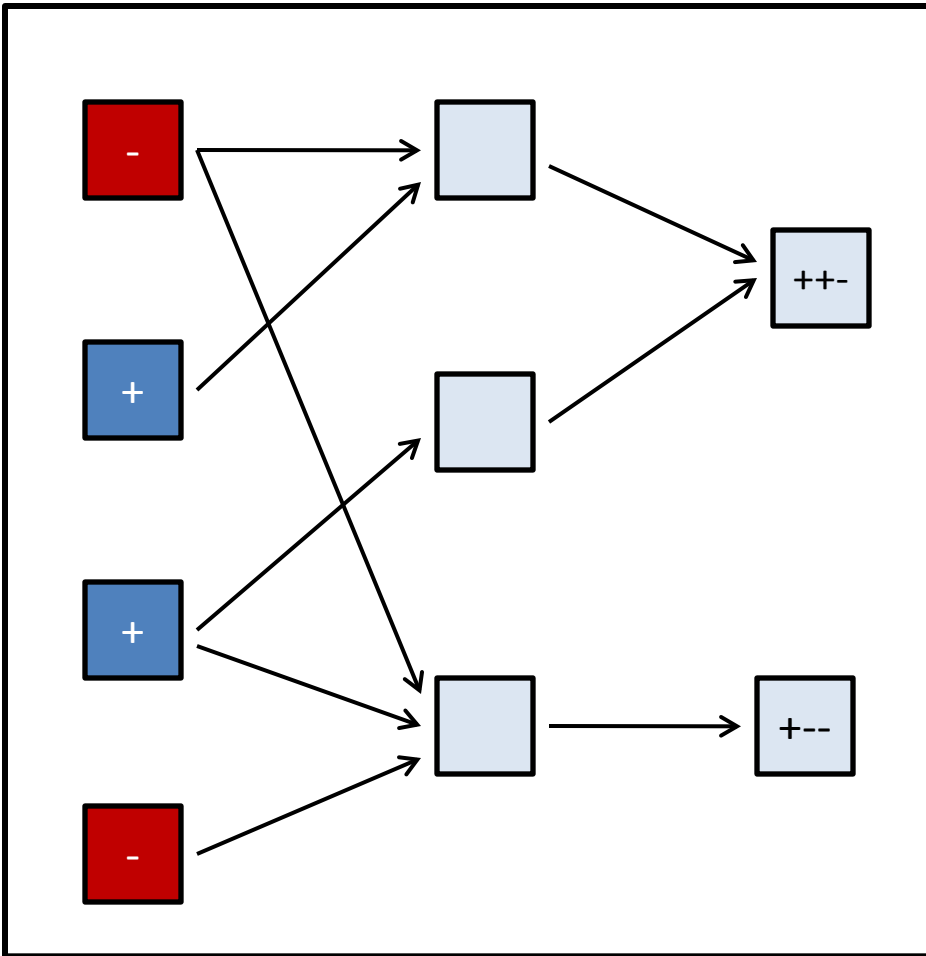


Learning with a DB-KB



- Location(x)=US
- Location(x)=Southwest
- Location(x)=Southwest & zone(location(x))=Zone
- Location(x)=Southwest & zone(location(x))=Hot

Spreading Activation Learning

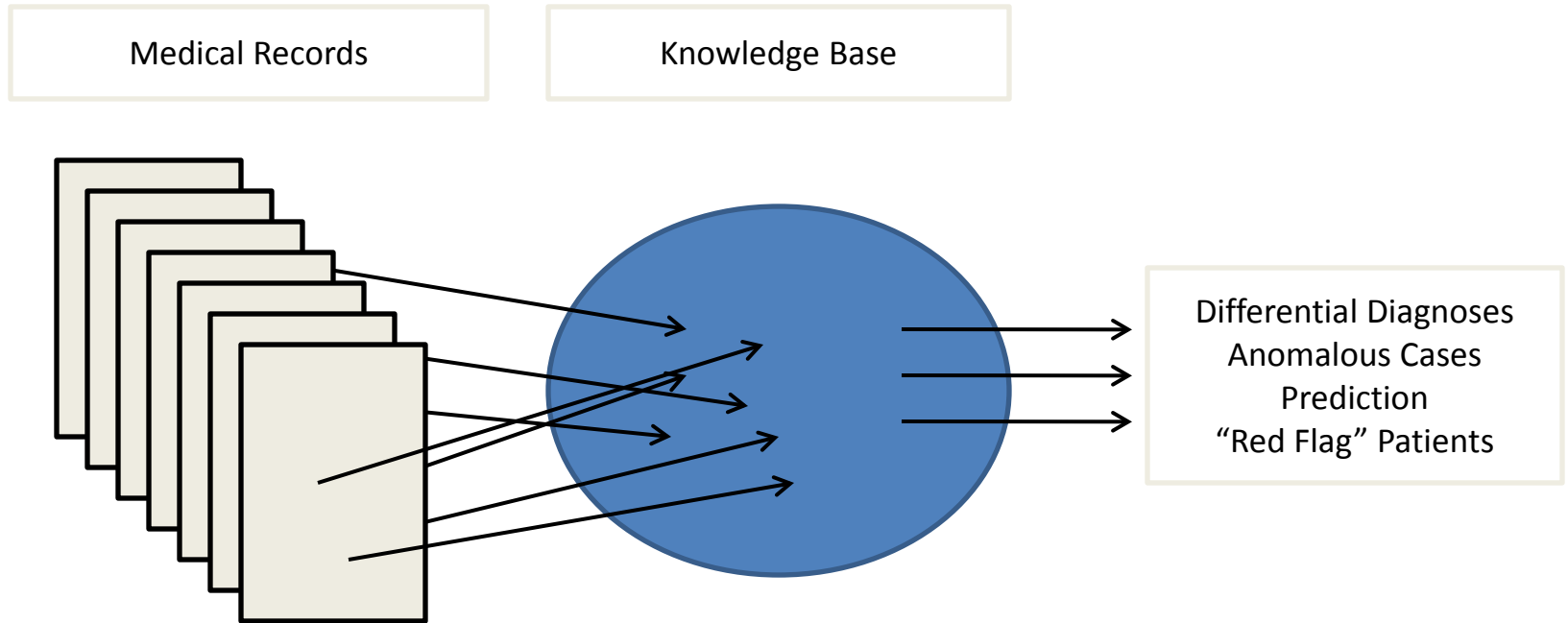


- Place + markers on concept.
- Place – markers on complement.
- Propagate through database.
- Find where markers accumulate.

Past Work

- “Increasing the Efficiency of Data Mining Algorithms with Breadth-First Marker Propagation,” Aronis and Provost, KDDM 1997.
- “The WoRLD: Knowledge Discovery from Multiple Distributed Databases,” Aronis et al., FLAIRS 1997.
- “Augmenting Medical Databases with Domain Knowledge,” Aronis et al., AAAI Spring Symposium on AI in Medicine 1996.
- “Scaling Up Inductive Learning with Massive Parallelism,” Provost and Aronis, MLJ (23) 1996.

Text Is Next!



Medical Informatics in EMS

- Bringing the EMR onto the ambulance.
- Text processing of prehospital reports.
- Evaluating interventions and models of care.
- Identifying (and isolating) contagious outbreaks.
- Identifying “Red Flag” patients and predicting adverse events.
- Transfer-of-care discourse analysis.
- Intelligent tutoring systems for paramedic training.
- Complexity of protocols.