

Outline for April 12, 2005

1. Take-Grant
 - a. Introduce as counterpoint to HRU result
 - b. Show symmetry
 - c. Show islands (maximal subject-only tg-connected subgraphs)
 - d. Show bridges (as a combination of terminal and initial spans)
2. Predicates
 - a. $\text{can}\bullet\text{share}(r, \mathbf{x}, \mathbf{y}, G_0)$ iff there is an edge from \mathbf{x} to \mathbf{y} labelled r in G_0 , or all of the following hold:
 - i. there is a vertex \mathbf{y}' with an edge from \mathbf{y}' to \mathbf{y} labelled r ;
 - ii. there is a subject \mathbf{y}'' which terminally spans to \mathbf{y}' , or $\mathbf{y}'' = \mathbf{y}'$;
 - iii. there is a subject \mathbf{x}' which initially spans to \mathbf{x} , or $\mathbf{x}' = \mathbf{x}$; and
 - iv. there is a sequence of islands I_1, \dots, I_n connected by bridges for which \mathbf{x}' is in I_1 and \mathbf{y}' is in I_n .
 - b. Go through interpretation
3. Schematic Protection Model
 - a. Model components
 - b. Link function
 - c. Filter function
 - d. Example: Take-Grant as an instance of SPM
 - e. Create operations and attenuation
4. Expressive power
 - a. HRU vs. SPM
 - b. Multiparent joint creates in HRU
 - c. Adding multiparent joint creates to SPM (giving ESPM)
 - d. Simulation of multiparent joint creates by 2-parent joint creates
 - e. Monotonic ESPM, monotonic HRU equivalent
 - f. Safety question in ESPM decidable if acyclic attenuating scheme
5. Comparing Expressive Power of Models
 - a. Graph representation
 - b. Go through 3-parent joint create as simulated by 2-parent joint create
 - c. Correspondence between two schemes in terms of graph representation
 - d. Formal definition of scheme A simulating scheme B
 - e. Model expressive power
 - f. Result: monotonic 1-parent models less expressive than monotonic multiparent models (so ESPM more expressive than SPM)
6. Typed Access Matrix Model
 - a. Add notion of type for entities—set of types T , set of subject types $TS \subseteq T$
 - b. New create rules: specify subject/object type
 - c. In command, child type if something of that type created; otherwise, a parent type
 - d. Show type graph and cycles in it
 - e. Safety decidable for systems with acyclic MTAM schemes