

CIS 525 Software Development of Parallel and Distributed Systems Fall 2008

Lecture 13: Tuesday, October 14, 2008

1. **Vicinity preserving net morphisms, continued:**
 - a) S-elements and T-elements of a net.
 - b) S-components and T-components of a net; subnet of a net.
 - c) Structural and behavioral properties of vicinity preserving nets.
 - d) Software design tool development based on net transformations and net morphisms.
 - e) “*Dell electronic store*” example with vicinity preserving net morphisms with modeling from several perspectives (customer, Dell, UPS).
2. **Event-Oriented Modeling (chapter 10.2; pp. of 135-143):**
 - a) High-level modeling – dividing a system into major components and defining communication interfaces (fusion places and transitions)
 - b) Example of *supermarket modeling* – with Customer, Shop, and Supplier as major components
 - c) Protocol modeling between major components of the system
 - d) Construction of nets for protocols – auxiliary construction of *place product* with respect to two given disjoint sets of places in a net
 - e) Protocol of the customer service in supermarket model.
 - f) Verification of protocols – example of *bank loan protocol*.

Lecture 14: Thursday, October 16, 2008

1. **Concepts of Bi-similarity in Petri nets (chapter 10.2; pp. of 143-146):**
 - a) Strong bi-similarity (nets without abstraction) - definition
 - b) Interleaving bi-similarity vs. Step bi-similarity – definition and related examples
 - c) Branching bi-similarity –definition and related examples
 - d) Example of the protocol for customer service in supermarket.

2. Spectrum of modeling alternatives from P/T nets to CP nets:

- a) Example of resource allocation
- b) Several versions of resource allocation with P/T nets and CP nets
- c) Formation of functions that control enabling transitions and distribution of resources.

3. Distribution and discussion of the Take Home Midterm Examination**Remarks:**

1. Handout and explanation of Midterm Take Home exam – to be returned on Thursday, October 23, 2008; this midterm replaces lecture # 15 on October 21, 2008.
2. October 23, 2008 is also a deadline of Project#1.