**CIS 525 Software Development of Parallel and Distributed Systems**

**Petri nets –several principles**

1. **The Principle of Duality for Petri Nets:**

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| PN elements | Petri net name terms | Entities of the real world |
| P-elements | State elements, places | interpreted as passive elements: conditions, places, resources, waiting pools, channels, etc. |
| T-elements | Transition elements, transitions | interpreted as active elements: events, transitions, actions, executions of statements, transmission of messages, etc |

1. **The Principle of Locality for Petri Nets**

The behavior of transition exclusively depends on its locality, which is defined as the totality of its input and output objects (pre- and post-conditions, input and output places,.…) together with the element itself.

1. **The Principle of Concurrency for Petri Nets**

Transitions having disjoint locality occur independently (concurrently).

1. **The Principle of Graphical Representation for Petri Nets**

P-elements are represented by rounded graphical symbols (cycles, ellipses, …).

T-elements are represented by edged graphical symbols (rectangles, bars, …).

Arcs connect each T-element with its locality, which is a set of P-elements.

Additionally, there may be inscriptions such as names, tokens, expressions, guards.

1. **The Principle of Algebraic Representation for Petri Nets**

For each graphical representation there is an algebraic representation containing equivalent representation. It contains the set of places, transitions, and arcs, and additional information such as inscriptions.