

Phase III: Mental Representations of Spatial Environments

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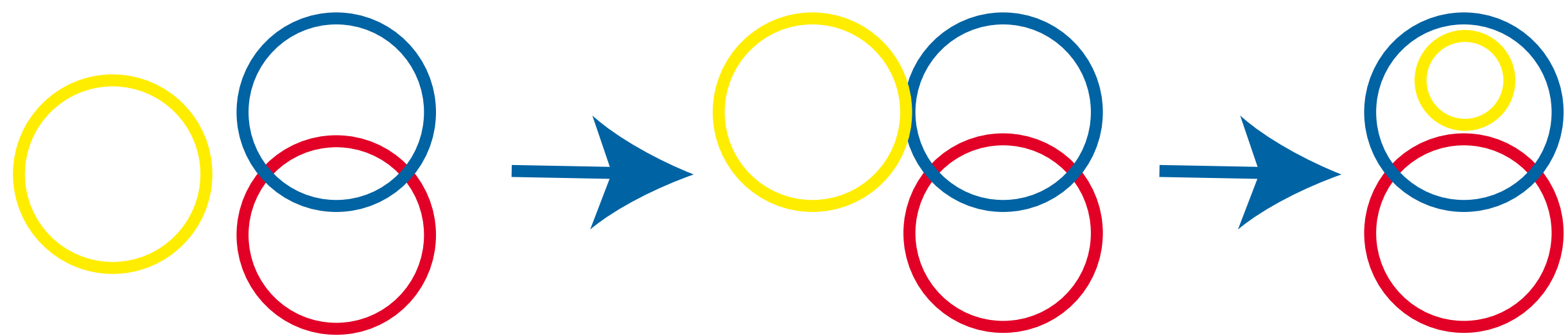
Modeling

Control (Selection and Sequencing)

- Applicability of the CSM to other spatial abilities
- Applicability of the CSM to control of Casimir's components
- Control of sequencing in spatial cognition

Mental Model/Image Exploration

- Under-specified reasoning tasks
- Model manipulation processes when exploring different valid mental models
- Transfer insights to model of mental imagery



Scalable Working Memory Structures

- Implement identified dependencies in knowledge type integration
- Implement representation structures for topology and distance based on empirical results
- Integration of shape knowledge with other spatial knowledge

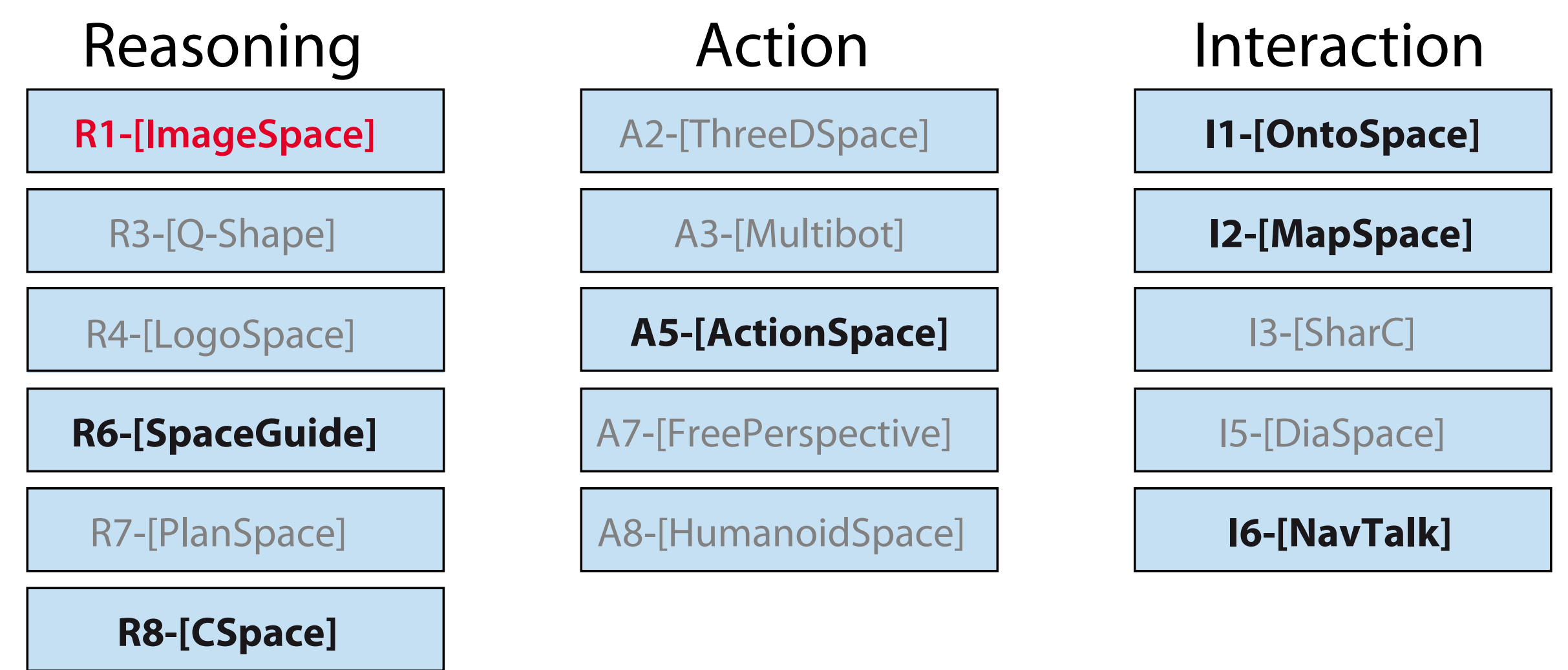
Application

Eye Tracking and Design Assistance

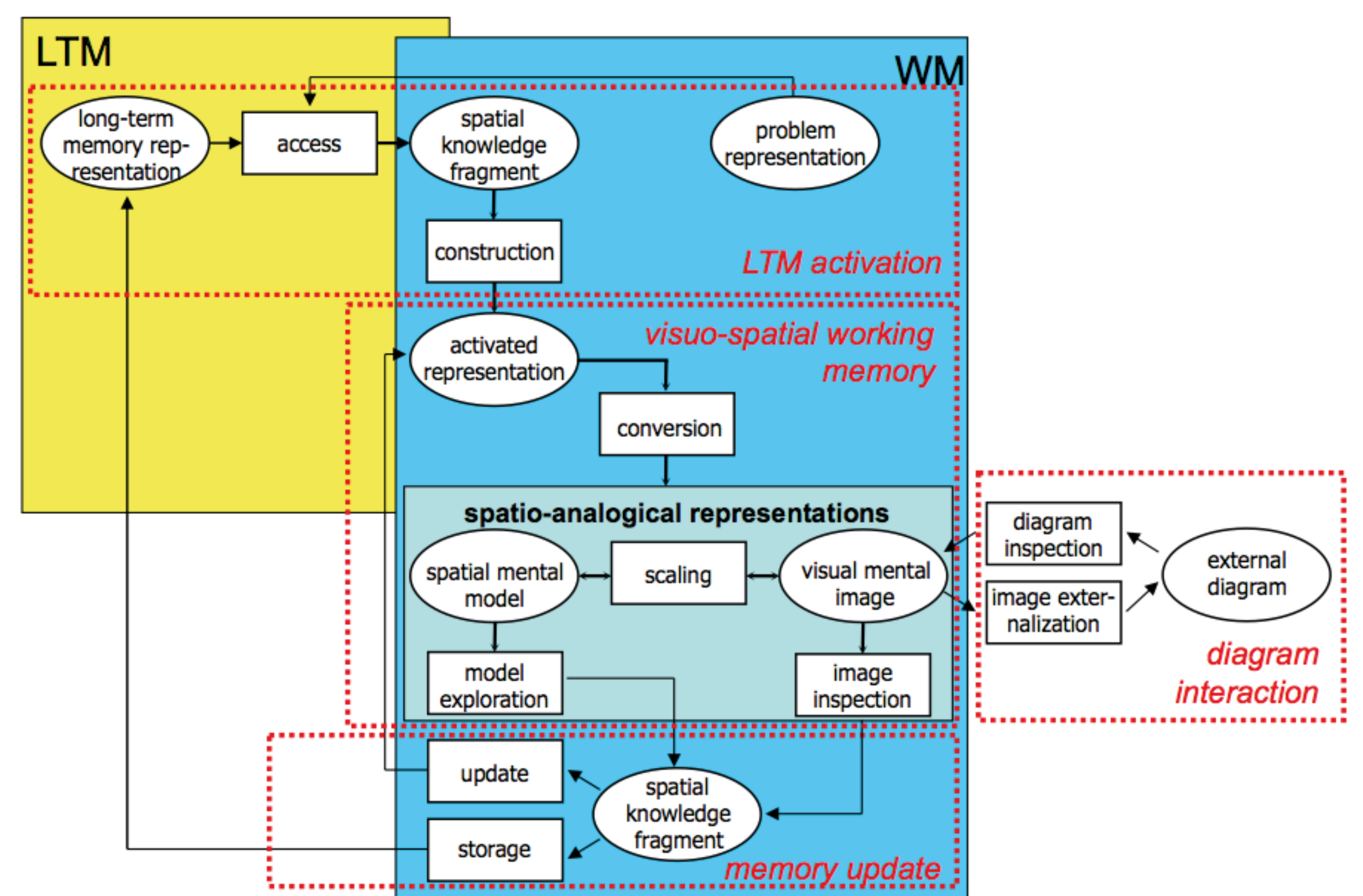
- Combine interactive eye tracking platform with CosyCad
- Integration of multi-model input (eye and head movements, haptics, design actions) with attention model, human spatial preferences and action anticipation
- Manipulation of attention to guide to optimal solution

Training and Tutoring

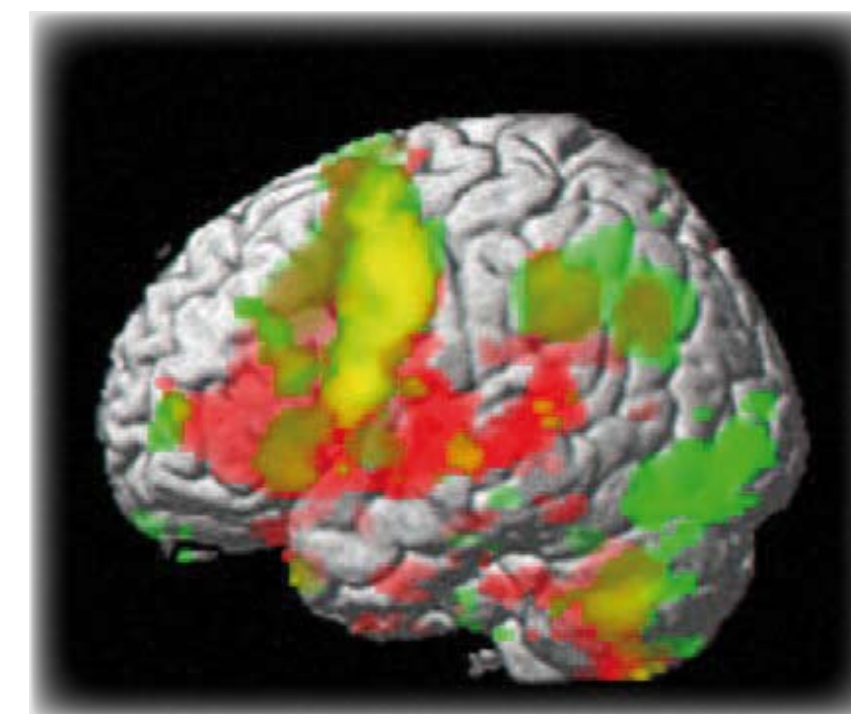
- Cooperation with Spatial Intelligence and Learning Center (SILC)
- Application of developed cognitive models in tutoring scenarios
- CosyCad in education of architects



U Lund, U Notre Dame, U Illinois, Spatial Intelligence and Learning Center, Project [DesignSpace]



Empirical Studies



fMRI

- Distinction between mental models and mental images
- Neuroscientific link-up of Casimir

Preferred Mental Models

- Reasoning with topological knowledge
- Reasoning with distance knowledge

Knowledge Type Integration

- Human preferences in knowledge integration
- Combination of different types of knowledge
- Successive representations growth

