NEXUS –
Augmented World Models for Mobile Context-aware Applications

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Motivation

**Wireless Networks**
- WAN, LAN, PAN
- Infrastructure-based, Ad Hoc

**Sensor Technology**
- Identification
- Position
- State, Environment

**Mobile multi-functional Devices**
(Embedded) interactive Systems
-> „Smart Things“

Navigation
Location-based Services
„Sentient Computing“
„Ubiquitous Computing“

Context-aware Systems

Physical World
Digital World

Miniaturization
Decline in prices
Vision: Federated World Models

Data from Billions of Sensors

Navigation „Smart Factory“ City Guide

Applications

Federation

WWW Digital Libraries

World Models Information Spaces

Research Group “Distributed Systems”

University of Stuttgart IPVS
Vision: Nexus-Platform
Connects Physical and Digital World

Federated World Models
- Sensor Integration, Consistency
- Metaphors for Linking Information
- Temporal Concepts

Supports Model Interaction
- Synchronous: Spatial Queries
- Asynchronous: Spatial Predicates/Events
- Visualization

Supports
- infrastructure-based
- infrastructureless, hybrid Systems

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IPVS
(Almost) Automatically Generated Model
Spatial Events

- Proactivity is important in mobile, location-aware computing
- Can be supported by event observation/notification mechanism

Ask for autograph...

You wanted to buy shoes...

Meeting Event

Enter Area Event

Shoes

You wanted to buy shoes...

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Event Service: Research Goals

Overall goal: Investigate architectures and mechanisms for Internet-scale event management

- Distributed observation of complex events
  - Specification of distributed events
  - Parameters for describing semantic aspects: event consumption policy, time issues
  - Framework for distributed observation
  - Optimal distribution of observation

- Delivery of event notifications
Thank you very much for your attention!

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