# **Trust Modelling in Socio-Technical Systems**





**TRUST MODEL** for Socio-Technical Systems

#### Domains

Social Psychology

- Subjectivity, Cost/benefit analysis

• Sociology

- Social Relations, Culture

Philosophy

- Why trust?

Neurological / Cognitive
- Biological and brain processes

## Web Community: "The Pioneers"

• Example Applications

- Recommendation systems (eBay, Amazon)

- *m*-Commerce (Banking etc.)



## **Trust Model: Behavioural Factors**

INTENTIONS	EMOTIONS	INDIVIDUALISM
Trust (neighbours) /	Fear / Hope /	Expressiveness /
Belief (options)	Attractive power	Openness / Contagion

**TRUST:** Attitude of an agent towards an information source(s) that determines the extent the source(s) influences the

#### **Factors**

- System quality (navigational structure, visual appeal)

- Cultural Differences

## **Trust in Tech.: Hazardous Situations**

#### • Difficulties

- Highly volatile system dynamics
- (ultra-) Large-scale systems
- Complex (unpredictable) social / personal behaviour
- Collection of empirical evidence not possible

### **Emotional Decision Making Model** Evacuation based on neurological theory of Hesslow



agent's belief(s), horizantal to emotional and individual considerations.

The emotional decision making model for to move to exit E

## **Simulation for Evacuation Scenario**

HYPOTHESIS: A more trustworthy (AmI assisted, device-enabled) agent influence the beliefs (consequent actions) of an agent more...



Scenario: Linz main railway station

*LifeBelt: AmI assistance during evacuation (tactile feedback)* 

Modelling framework for socio technical system

#### **SIMULATION:** Results on trust model for evacuation

Nearest Exit: Without LifeBelt, with Trust Model

Recommended Exit: with LifeBelt, with Trust Mode

Evacuation: 66% (dpr=1%), 81% (2%), 88% (4%), 96% (100%)



Geometry of one floor and corresponding NetLogo model Improved evacuation efficiency, more balanced exit usage

#### *Remarkable "follower" for Aml assisted agents*



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