FORWARD SELF-COMBINED METHOD FRAGMENTS

NOÉLIE BONJEAN
Design New AOSE Methods
Challenges

- Design a tailored method
- Reuse part of existing methods

Examples

- PASSIM: PASSI and Distilled State Charts (DSC)-based simulation method [M. Cossentino & co., IJAOSE 2008]
- ADELFE and TROPOS [M. Morandini & co., ESAW 2009]
Combining Fragments: a Complex System

- Numerous entities
- Huge number of interactions
- Openness

Adaptive Multi-Agent System

SCoRe: Self-Combined Method Fragments
Outline

- Requirements of SCoRe
- Parameters of SCoRe
- SCoRe System
  - Example of SCoRe execution
  - Behaviour of agents
  - General structure
- Adaptation of SCoRe
- Conclusion and Future Works
Requirements of SCoRe

- **Functional**
  - Providing a tailored method
    - User context
    - System characteristics
  - Self-combining fragments
    - Guidance Tool

- **Non functional**
  - Studying for the compatibility of each fragment with the others
  - Dynamic adaptation to the context at processing time
Parameters of SCoRe

**Users**

- UML
- Java
- SpeADL
- MAY

**Technologies**

- ADELFE
- PASSI
- INGENIAS
- TROPOS

**Methods**

- Agent
- Cooperation
- Emergence

**Paradigms**

**Field**

- Automotive
- Biology
- Maritim
- Surveillance
- Aviation
- Industry

**Phase of Initial Work Product**

- Analysis
- Requirement
- Implementation
- Design

**Phase of Final Work Product**

- Analysis
- Requirement
- Implementation
- Design

**Type of System**

- Profiling
- Simulation
- Self-regulation
- Optimization
- Manufacturing Control
SCoRe: Self-Combining method fRagments

Running Process

Initial MMME

Final MMME

Context Set

Running Fragment

Waiting Fragment

Interaction

WF

RF

MMME
SCoRe : Self-Combining method fRagments
MMME Agent

- Aims at choosing which fragment it will be linked to

any producer or consumer is required

unsatisfied

satisfied

linked to at least one consumer
and one producer
Waiting Fragment Agent

- Aims at notifying any agents of any requests from MMMEs

- requested by a MMME to satisfy it

- satisfied

- available for any request

- declared

- waiting for answer from context

- alarmed

- choosen by a MMME to be added in the running process

- selected
Running Fragment Agent

- Aims at being integrated in a process once it is in an adequate situation

\[\text{all the required MMMEs are satisfied and at least one of the provided MMMEs is satisfied}\]

\[\text{one required MMME is unsatisfied or all provided MMMEs are unsatisfied}\]
Context Agent

- Aims at evaluating pertinence of the waiting fragment which they are linked to

\[
\text{all its characteristics are verified} \quad \rightarrow \quad \text{relevant} \rightarrow \text{selected} \\
\text{irrelevant} \quad \rightarrow \quad \text{at least one of its characteristics is not verified} \\
\text{the context agent is accepted by the running fragment agent.}
\]
General Structure of SCoRe
Adaptation of SCoRe

- Modification of the users’ characteristics
- Modification of the system characteristics
- Addition and deletion of fragments agent during runtime

System reorganization
Adaptation Examples

- User adds a specific fragment in the method process
  ⇒ SCoRe have to propose a new method process including the new fragment

- No contexts are satisfied
  ⇒ SCoRe have to adapt and choose one context
Conclusion

- **SCoRe**
  - Self-design a tailored method process
  - Adjust the proposed process according to the characteristics of application domain and users profile
  - React to dynamics
Current and Future Works

- Evaluation of the designed process
  - MAS Metamodel Metrics [AAMAS 2012]
  - Fragment Metrics

- Inter-operability of metamodel
  - Semantic matching of MMME
  - Ontology based

- Experimentation with real users’ problems
Thank You For Your Attention