Communicating the Logic of a Treatment Plan Formulated in Asbru to Domain Experts

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Overview

motivation
challenges
visual representation
interaction, focus + context
user centered design
limitations
conclusions
Road to Computerized Guidelines and Protocols

- Data Abstraction
- Guideline Execution
- Guideline Authoring
- Formal Methods
- Formal Guideline Representation
Users’ Challenges

time saving

minimal learning effort

intuitive, simple, and clearly structured

Flow-Chart Algorithms / Clinical Algorithm Maps

Standards Proposal:
Society for Medical Decision Making, 1992
Asbru’s Challenges

- logical sequences
- hierarchical decomposition
- flexible execution order
  - sequential, parallel, any-order, unordered
- state characteristics of conditions
Visual Representation

Plan Name
STOP Abort Condition

Plan
User-performed plan

Cyclical Plan
repeat specification

If-Then-Else
yes
Variable Assignment(s)
no

Execution Sequence Indicator

sequentially
parallel

any-order
unordered
Plan Examples

**Ventilation Plan**

1. **Initial Plan**
   - **Controlled Ventilation**

   - **STOP**
     - FiO2 > 90 or PIP > 25 or PCO2 > 100

   - **FiO2 <= 40 and PIP <= 20**

**Handle PCO2**

- **STOP**
  - FiO2 > 90 or PIP > 25 or PCO2 > 100

- **PCO2_calc > 60?**
  - yes: \( f = \frac{\text{PCO2}_\text{calc}}{\text{PCO2}_\text{calc} + 5} \) * \( f \)
  - no

- **PCO2_calc < 40?**
  - yes: \( f = \frac{\text{PCO2}_\text{calc}}{\text{PCO2}_\text{calc} - 5} \) * \( f \)
Focus + Context
Prototype
3-step evaluation process
qualitative
scenario-based
Limitations

- no temporal aspects
- execution support limited
- introduction of new concepts
- representation cumbersome for certain constellations
Conclusions

visual communication of the logic of a treatment plan to domain experts
+ quick verification of formal representation based on a well-known representation
incorporation of Asbru concepts
interactive exploration, focus + context
user centered development approach