

A Fuzzy Arden Syntax Compiler

Karsten Fehre^{1,2}, Harald Mandl², Klaus-Peter Adlassnig^{1,2}

¹Section for Medical Expert and Knowledge-Based Systems
Center for Medical Statistics, Informatics, and Intelligent Systems
Medical University of Vienna
Spitalgasse 23
A-1090 Vienna, Austria
www.meduniwien.ac.at/mes

²Medexter Healthcare GmbH
Borschkegasse 7/5
A-1090 Vienna, Austria
www.medexter.com

Introduction

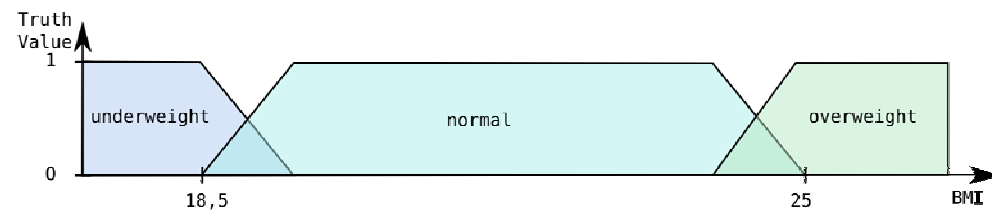
Arden Syntax

- Health Level Seven (ANSI)
- Clinical decision support

Fuzzy Arden Syntax

- first proposed by Tiffe, enhancements and mathematical background by Vetterlein

- Fuzzy Sets, Fuzzy Logic



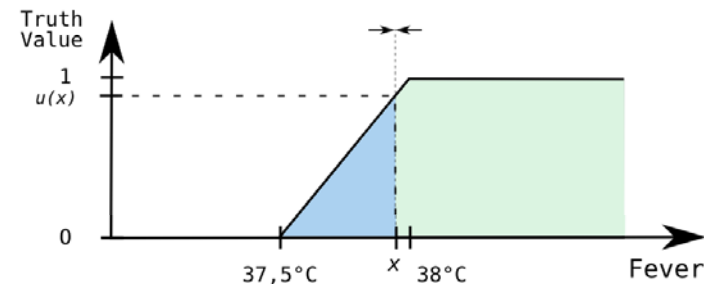
- Fuzzy Data Types vs. Crisp Data Types
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Motivation

Calculation: UTI-C for a single patient at a specific date

```
logic:  
  UTI_C := ( fever AND urinUrgency AND ... );  
  conclude true;  
;;  
action:  
  return UTI_C;
```

- **Arden Syntax**
concludes either TRUE or FALSE
- **Fuzzy Arden Syntax**
concludes also values between 0 and 1



Note: Fuzzy Arden Syntax also allows "conclude **UTI_C**;" to execute the action slot with corresponding weighting.

If-Then-Else: Aggregate and Branching

Source

```

maintenance:
[...]
```

knowledge:

```

[...]
```

logic:

```

//define BMI as above
[...]
```

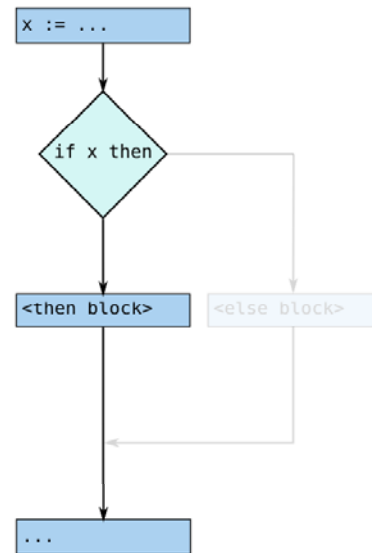
```

myBMI := 19;
x := myBMI <= BMI.normal;

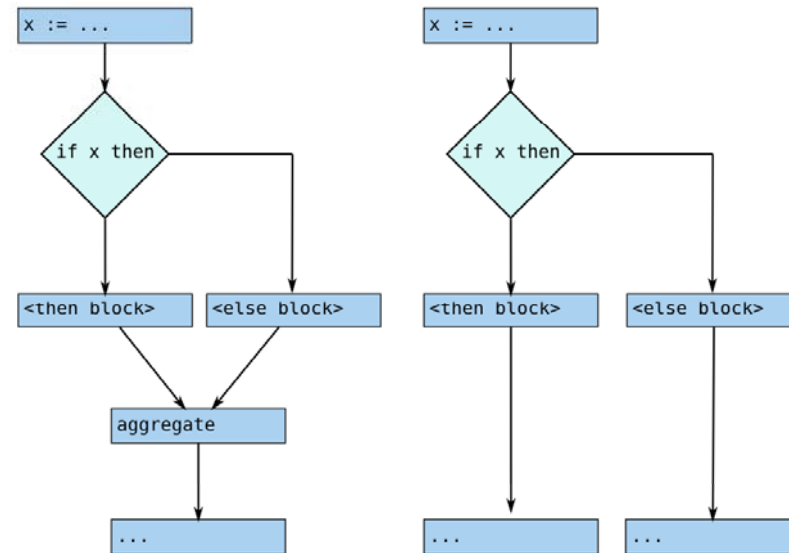
if x then
  <then_block>
else
  <else_block>
endif;
[...]
```

end:

Arden Syntax



Fuzzy Arden Syntax (parallel execution)



Results

- **BNF** for Fuzzy Arden Syntax
 - **compiler** and **engine** are integrated into a web-service-based server framework with standardized interoperability
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