Notation3 and the Internet of Things

### Notation3 101
- Notation3 (N3) is a logical framework for the Semantic Web [1].
- It can be used to write inference rules.
- Uses built-in predicates to calculate new values.

### Issues
- Writing arithmetic calculations in N3 is cumbersome.
- A lot of data in the Internet of Things (IoT) is numeric.
- Rules for the Semantic Web of Things (SWoT) are required to perform (complex) calculations.

### N3X

#### Description
- Use the syntax of SPARQL expressions for calculations.
- N3X-expressions can be used at every position within a triple.
- Each N3X-expression is a function call whose arguments can be function calls again.
- In contrast to N3, this allows for easy nesting of expressions.
- Nesting expressions generally reduces the number of triples required.
- Therefore, less computation is required to evaluate an N3X-rule.
- The explicit function calls in N3X are a suitable hook for custom expansion functions.

#### Evaluation
N3 rules using arithmetic calculations have been rewritten to N3X. The evaluation can be found at [https://github.com/MattesWhite/n3x](https://github.com/MattesWhite/n3x).

Figure 1: Resulting reduction of triples by using N3X.

#### Example and Comparison

![Image](https://example.com/image.png)

Figure 2: Euclidean distance between two 2D-points.

### Other

#### Support us - answer our questionnaire
Help us improving N3X by answering the questionnaire linked by QR code or at: [https://forms.gle/t51u3jS1kNK9uYa9](https://forms.gle/t51u3jS1kNK9uYa9)

#### References

www.ti.rw.fau.de