

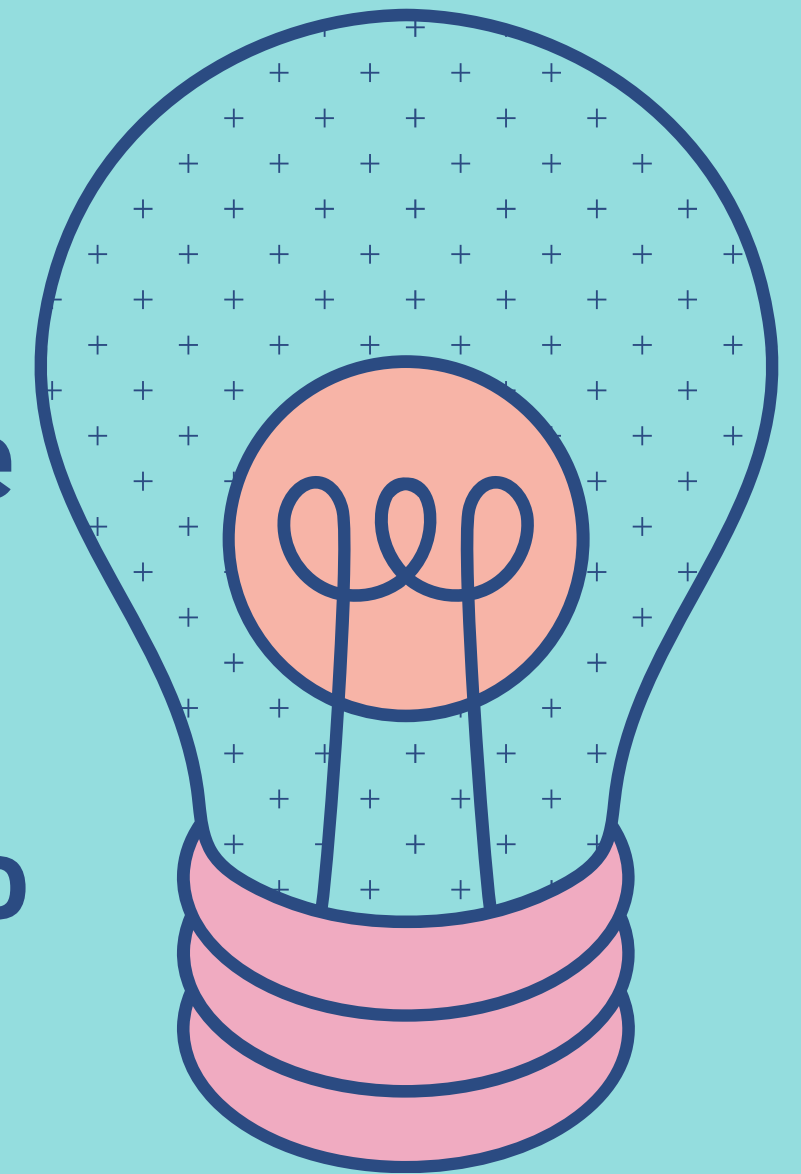


Extending Defeasible Reasoning beyond Rational Closure

Defeasible Knowledge base generator
by Mamodike Sadiki - SDKMAM001

Project Goals

- To create an optimized pseudo-random defeasible knowledge base generator using multi-threading per task.
- To improve the level at which information can be expressed by improving complexity selection.
- To optimize defeasible knowledge base generation by using existing knowledge bases to create new ones.
- To introduce a new parameter: Transitivity
- Monte Carlo simulation: Study parameters



Project Outcome

- Pseudo-random defeasible knowledge base generator using multi-threading, with simple and complex statements.
- A pseudo-random defeasible knowledge base generator that reuses existing knowledge bases to create new ones (space-time trade-off).
- Transitive relation added in statements within the same rank.
- Monte Carlo simulation done with 300 trials



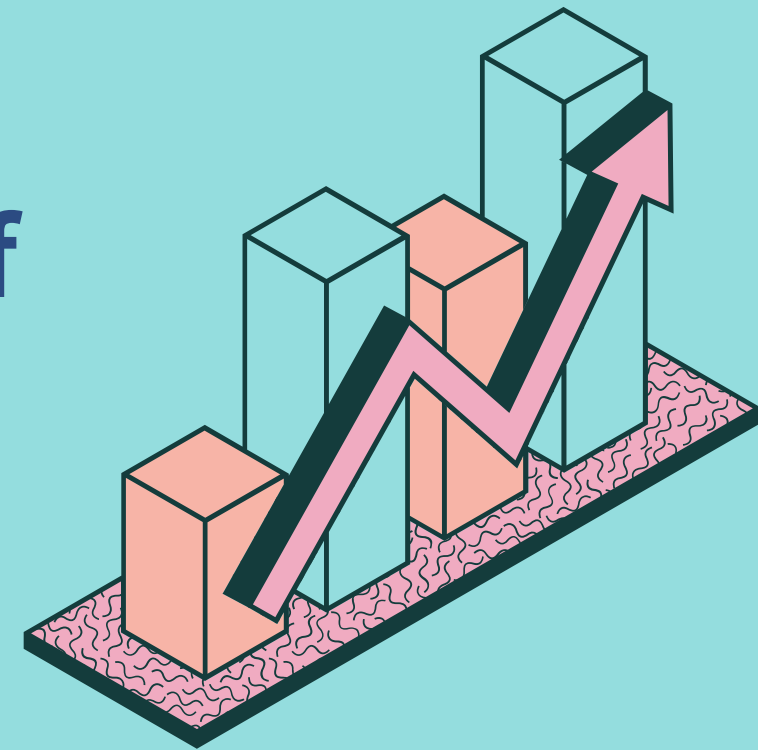
Challenges

- Assigning each thread to a task-
problematic for the generation of simple
statements and inefficient for the
generation of defeasible knowledge bases
with large statements-to-ranks ratio.
- Monte Carlo simulation: Generation time
under the same settings differs significantly.
- Generation by reuse: Deciding on control
parameters.



Solutions

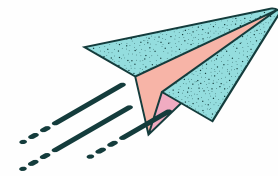
- Synchronizing access to propositional atoms and adding threads to handle the generation of statements per rank.
- Limiting control parameters to the number of ranks and statements to avoid deconstruction of existing knowledge bases.
- For the Monte Carlo Simulation taking an average of the generation time under the same setting.



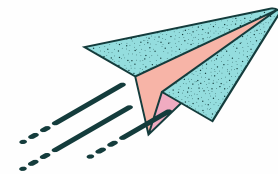
Demonstration

Generators

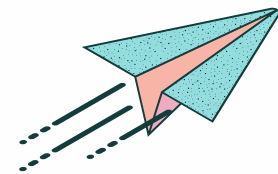
- **ov2** - Creates knowledge base without using the existing ones.
- **r** - Uses existing knowledge bases to create new ones.



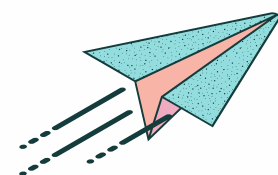
Simple defeasible knowledge base
generation-ov2 [ov2_s.txt]



Complex defeasible knowledge base
generation-ov2 [ov2_c.txt]



Generation by using existing
knowledge bases -r [r.txt]



Transitivity in ranks - ov2[ov2_t.txt]

