Dissertation Notes

nazgul.tazhigaliyeva

June 2017

1 XOR parser recipe shown using an example

1. Given input file that looks as follows:
   ϕ = father(x) $\neq$ Adam $\Rightarrow$ mother(x) $\neq$ Beth
2. Convert functions into relations:
   $\neg$ father(x,Adam) $\Rightarrow$ $\neg$ mother(x,Beth)
3. Retrieve domain D = {Adam, Beth}
4. Ground with rank k=0 w.r.t. domain D:
   Ground model:
   domain D 2 {Beth,Adam}
   $\neg$ mother(Adam,Beth) $\vee$ father(Adam,Adam)
   $\neg$ mother(Beth,Beth) $\vee$ father(Beth,Adam)
5. Perform RGND(ϕ) = GND(ϕ,0) $\cup$ {$\neg$ mother(Bob,Beth) $\vee$ father(Bob,Adam)}.
   Here, rank k=1, Bob is an arbitrary constant chosen from N-{Adam, Beth}, thus, now D = {Adam, Beth, Bob}:

   $\neg$ mother(Adam,Beth) $\vee$ father(Adam,Adam)
   $\neg$ mother(Beth,Beth) $\vee$ father(Beth,Adam)
   $\neg$ mother(Bob,Beth) $\vee$ father(Bob,Adam)
6. Perform XOR(ϕ) = RGND(ϕ) $\cup$ {XOR(t,D): t $\in$ T} T = {father(Adam), father(Beth), father(Bob), mother(Adam), mother(Beth), mother(Bob)}:

   XOR(ϕ) = ($\neg$ mother(Adam,Beth) $\vee$ father(Adam,Adam))
   $\wedge$ ($\neg$ mother(Beth,Beth) $\vee$ father(Beth,Adam))
   $\wedge$ ($\neg$ mother(Bob,Beth) $\vee$ father(Bob,Adam))
   $\wedge$ {(father(Adam, Adam) $\vee$ father(Adam, Beth) $\vee$ father(Adam, Bob))
   $\wedge$ (father(Beth,Adam) $\vee$ father(Beth, Beth) $\vee$ father(Beth, Bob))
   $\wedge$ (father(Bob,Adam) $\vee$ father(Bob, Beth) $\vee$ father(Bob,Bob))
   $\wedge$ (mother(Adam,Adam) $\vee$ mother(Adam,Beth) $\vee$ mother(Adam,Bob))
   $\wedge$ (mother(Beth,Adam) $\vee$ mother(Beth,Beth) $\vee$ mother(Beth, Bob))
   $\wedge$ (mother(Bob,Adam) $\vee$ mother(Bob,Beth) $\vee$ mother(Bob,Bob))}

   The above is an expected output.