

# Guiding Probabilistic Logical Inference with Nonlinear Dynamical Attention Allocation

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# Simple PLN Experiments

Based on two Markov Logic Networks (MLN)  
test examples from Tuffy project (<http://hazy.cs.wisc.edu/hazy/tuffy/doc/>)

- *smokes (below)*
- *RC1000 (research paper classification)*

```
// Predicate definitions
*Friends(person, person)
Smokes(person)
Cancer(person)
// Rule definitions
0.5 !Smokes(a1) v Cancer(a1)
0.4 !Friends(a1,a2) v !Smokes(a1) v Smokes(a2)
0.4 !Friends(a1,a2) v !Smokes(a2) v Smokes(a1)
```

(a) MLN program

```
Friends(Anna, Bob)
Friends(Anna, Edward)
Friends(Anna, Frank)
Friends(Edward, Frank)
Friends(Gary, Helen)
!Friends(Gary, Frank)
Smokes(Anna)
Smokes(Edward)
```

(b) Evidence

```
Cancer(x)
```

(c) Query

# Simple PLN+ECAN Experiments

Information provided in Smokes and RC 1000 examples is precisely the information needed for inference. No role for attention allocation.

*Attention allocation is useful largely for guiding inference toward relevant information.*

## Therefore

To test attention allocation in ECAN + PLN, one should modify standard MLN test examples via adding extraneous information

eats(Anna, cheese)  
tasty(cheese)  
derived\_from(cheese, milk)  
...

... and then optimize parameter space.