

Meta-langage endomorphique et planification abstraite pour la reconnaissance d'intention en temps réel



Soutenance de Thèse

Antoine Gréa

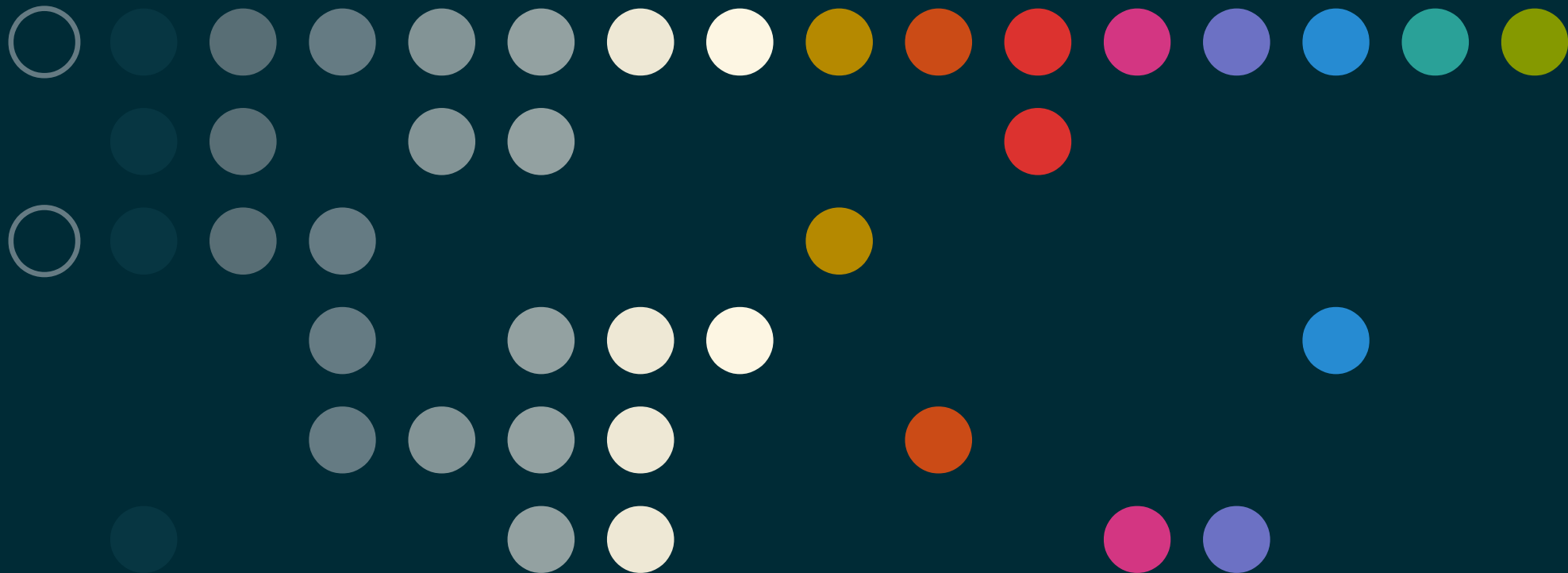
- *Encadrants*
 - Samir Aknine
 - Laetitia Matignon
- *Rapporteurs*
 - Eva Onaindia
 - Damien Pellier
- *Jury*
 - Hamamache Kheddouci
 - Ivan Varzinczak

1 Introduction

- Financements
- Contexte
- Sujet
- Problématique

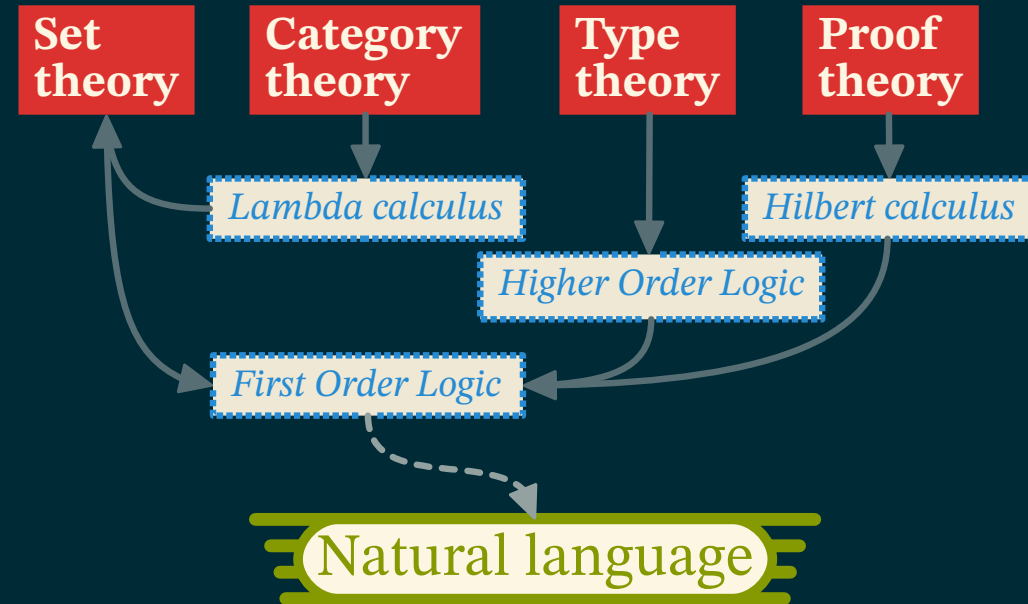
Plan

2 Fondamentaux



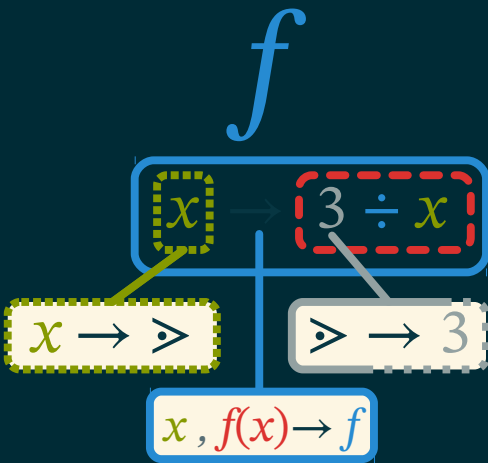
Fondation et Formalismes

- Qu'est-ce qu'une fondation ?
 - Abstraction
 - Formalisation
 - Circularité



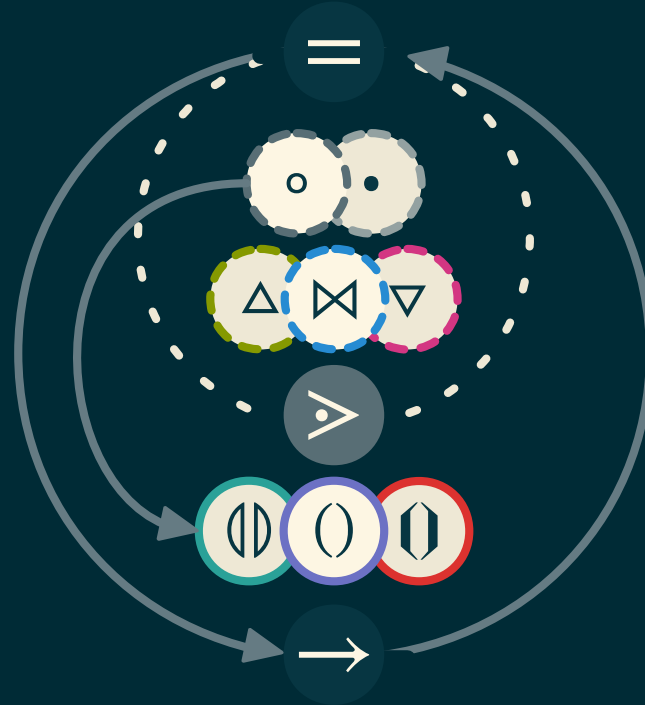
Théorie Fonctionnelle

- Basé sur la théorie des Catégories
- Axiomes
- Définitions
- Algèbre fonctionnelle



Legend

- definition
- variable
- ... literal
- expression



Legend

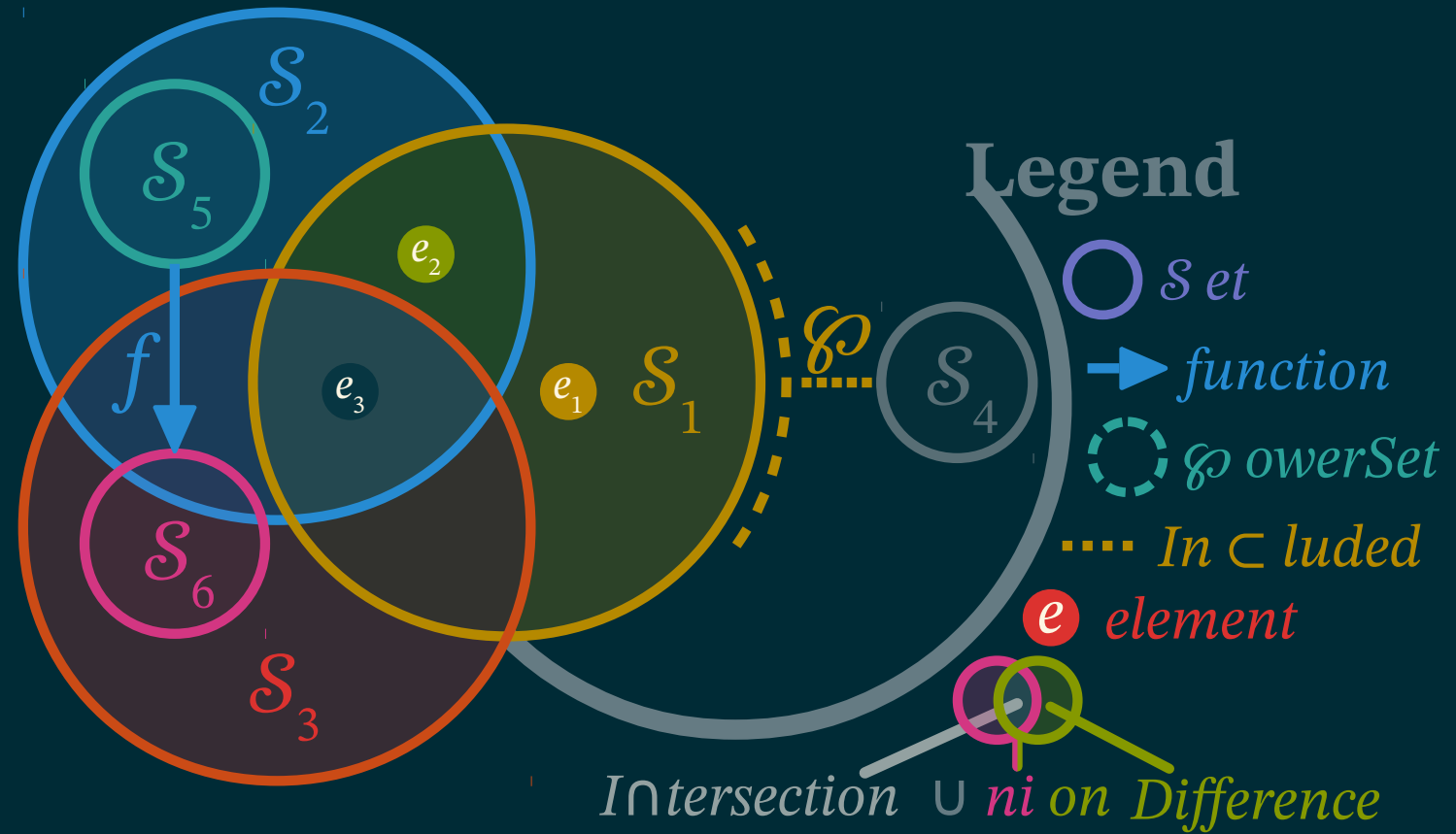
- a axioms
- b bases
- complement
- A algebraic
- b bounds
- boundaries
- \rightarrow depends

Logique et Raisonnements

- Logique du premier ordre
 - Booléen
- Logique d'ordre supérieure
- Logique Modale

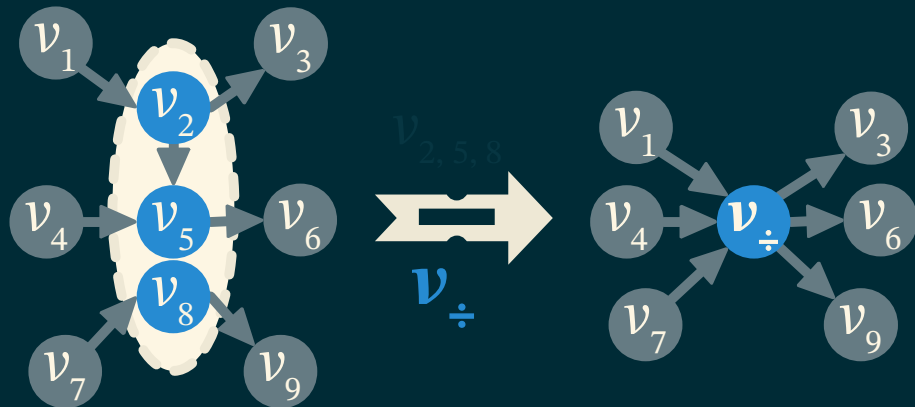
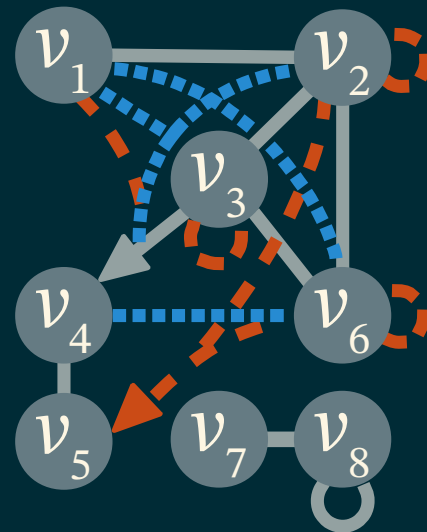
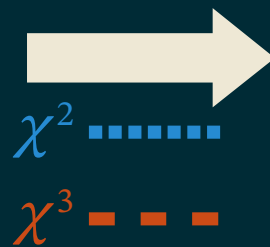
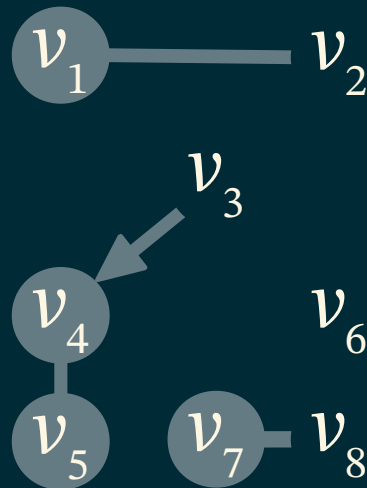
Théorie des Ensembles

- Définitions
- Opération
- ZFC

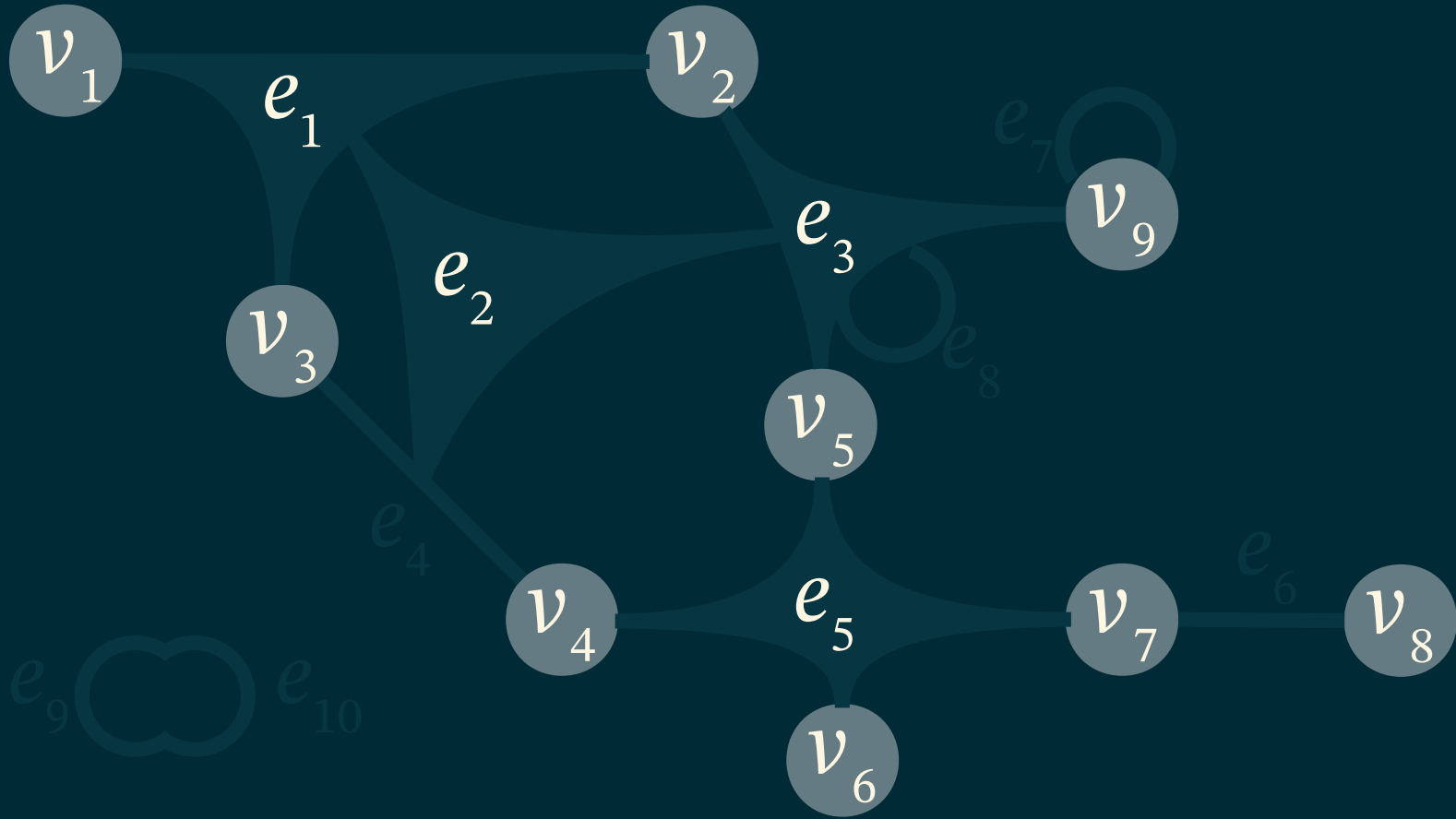


Graphes

- Adjacence, Incidence et Connectivité
- Propriétés
- Quotient



Hypergraphs



Faisceaux

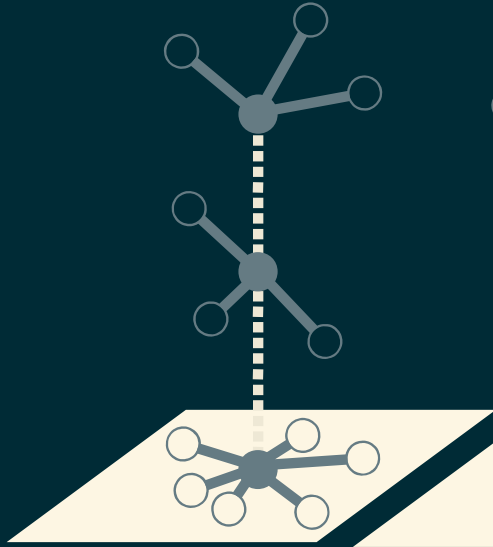
Legend

- Germ
- Connector
- ▨ Edge
- ⋮ Projection

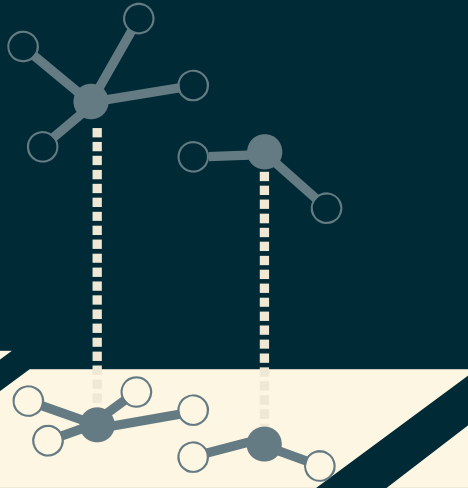


Seed

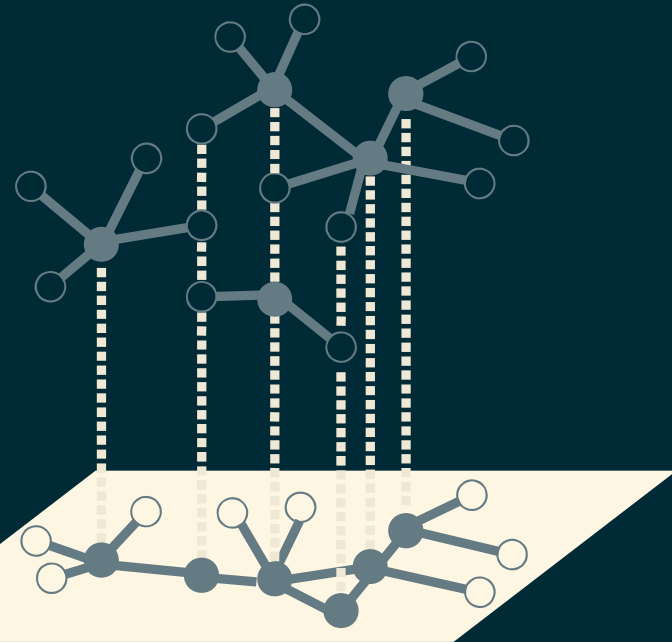
Section



Stalk



Stalk Field

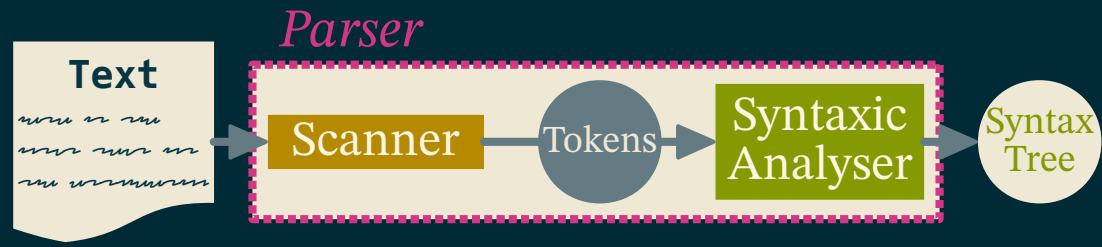


Sheaf

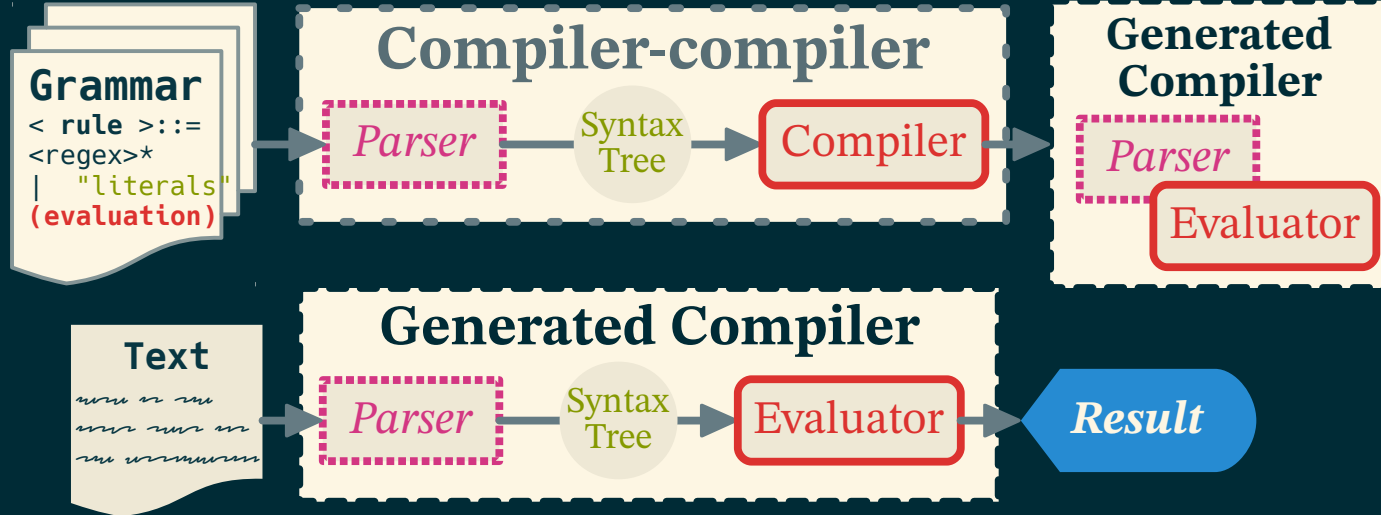
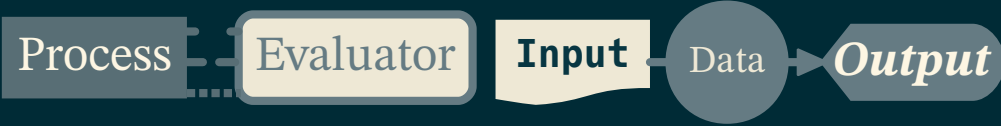
3 Représentation des Connaissances



Grammaire



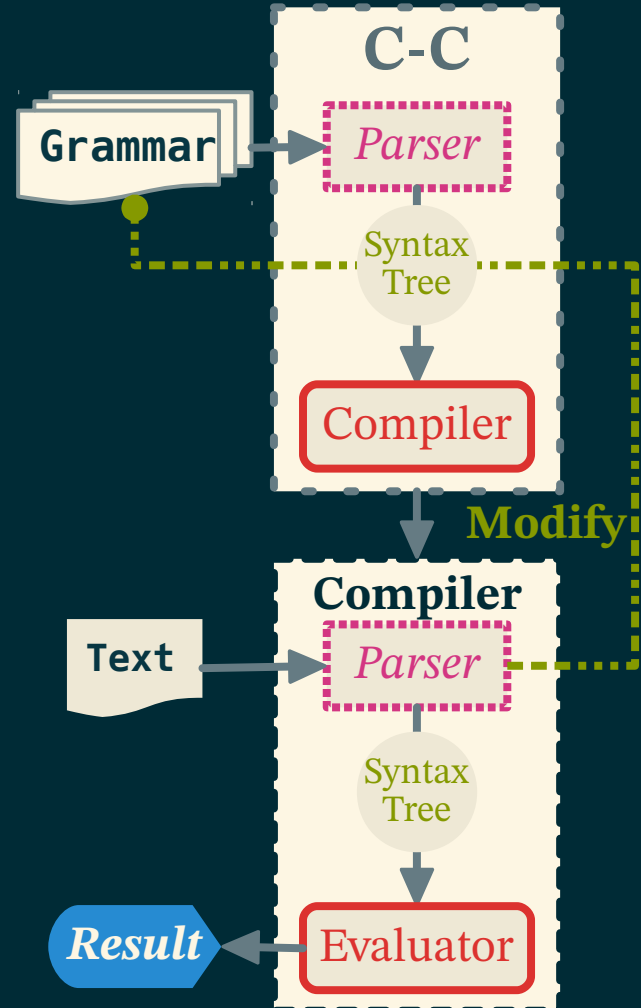
Legend



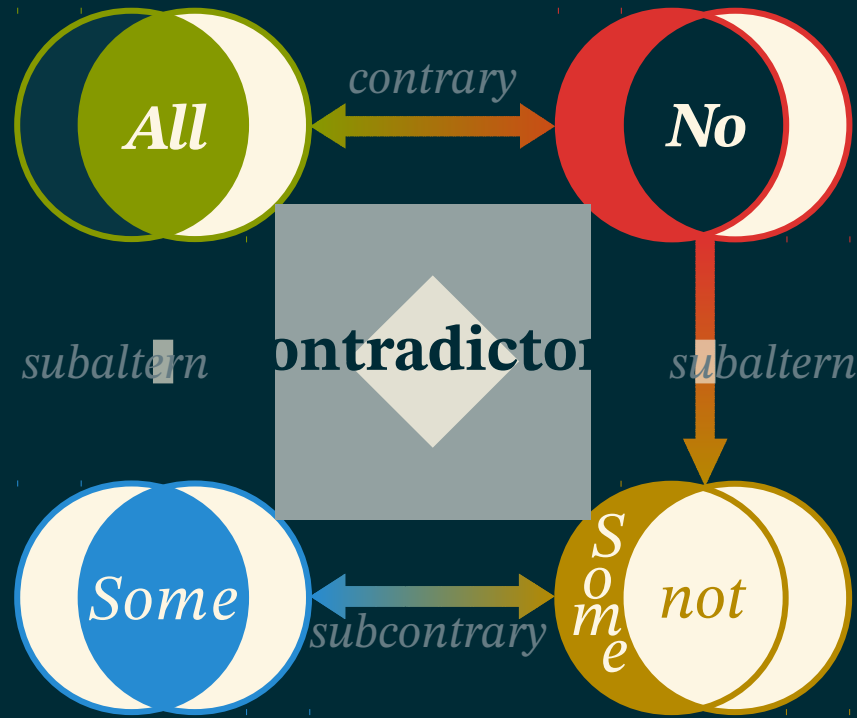
Legend



Grammaire Dynamique



Logique de Description



Legend

⊘ *empty*

e *not empty*

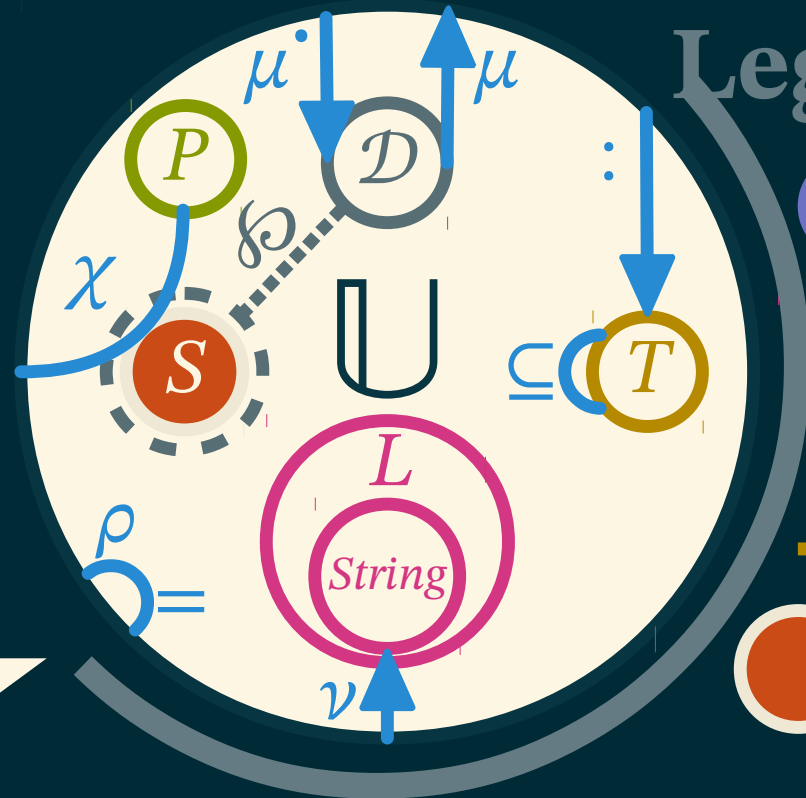
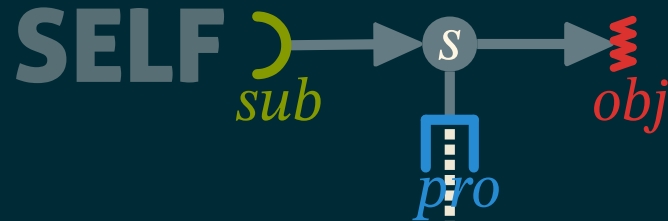
○ *free set*

*classical
logic*

Ontologies

- Formes
- Langages
- Limites

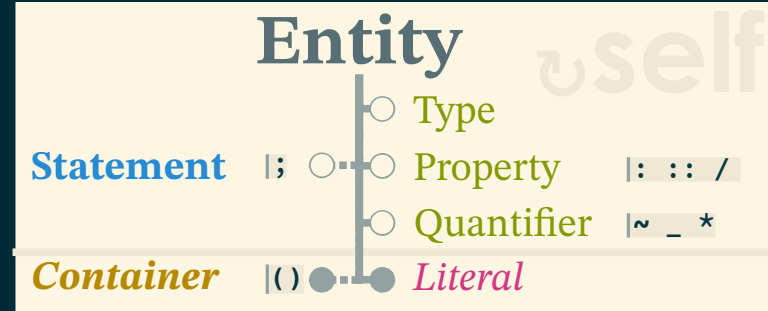
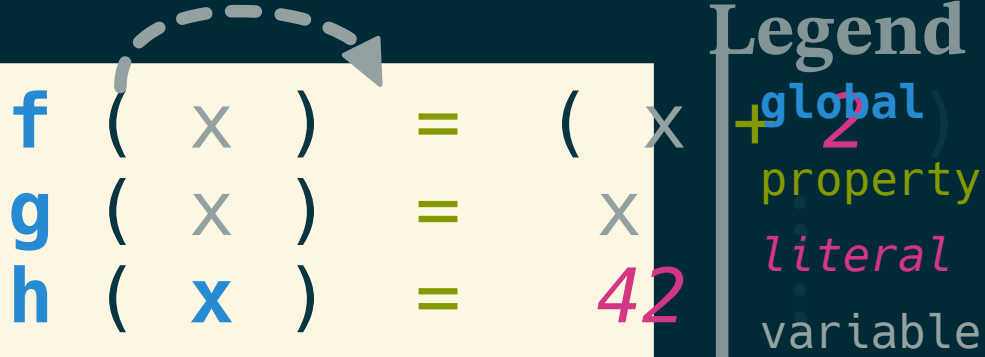
SELF



Legend

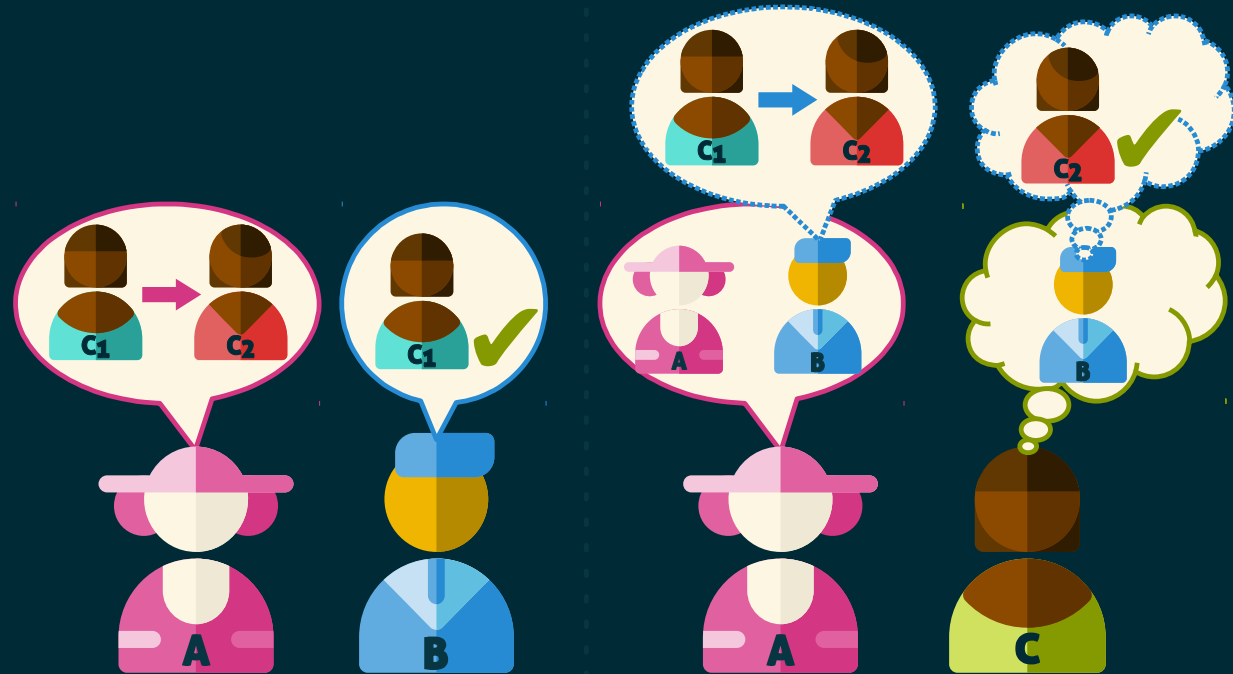
- \bigcirc *Set*
- \rightarrow *function*
- \bigcirc *powerSet*
- \cdots *Included*
- \bigcirc *graph*

Interprétation



Inférence

Example

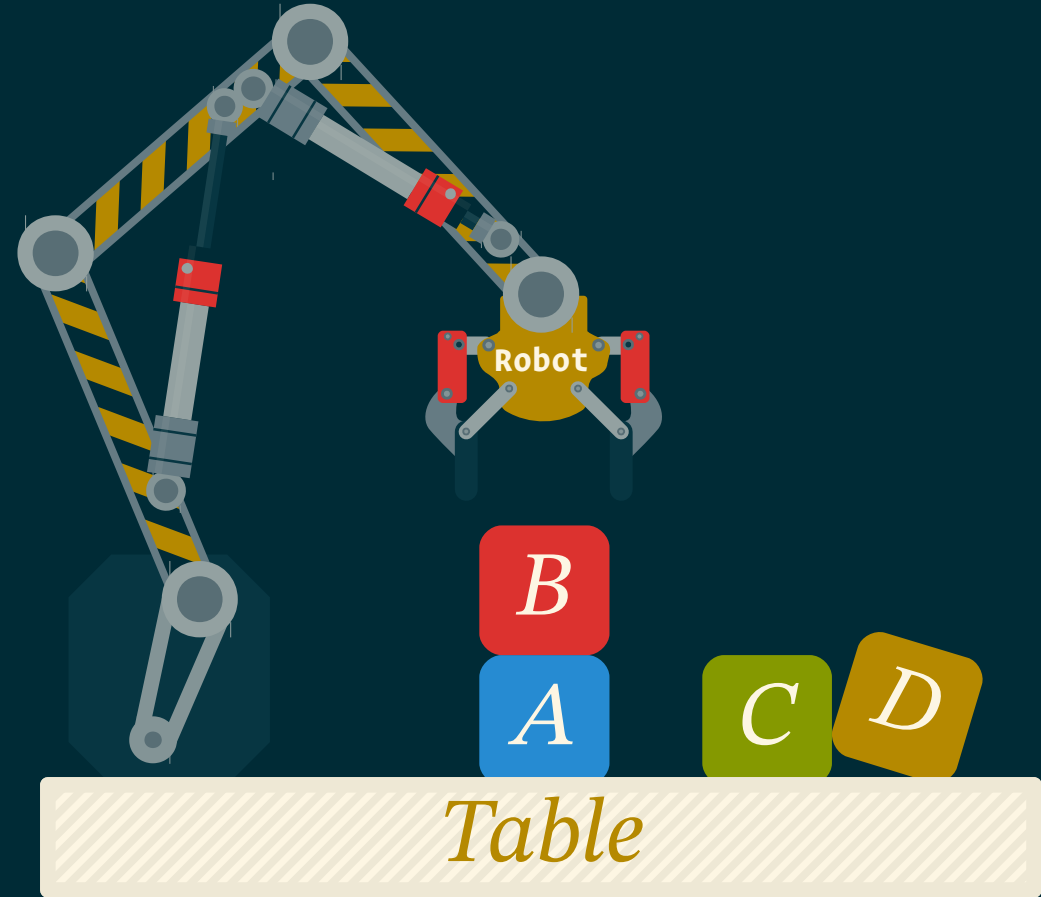
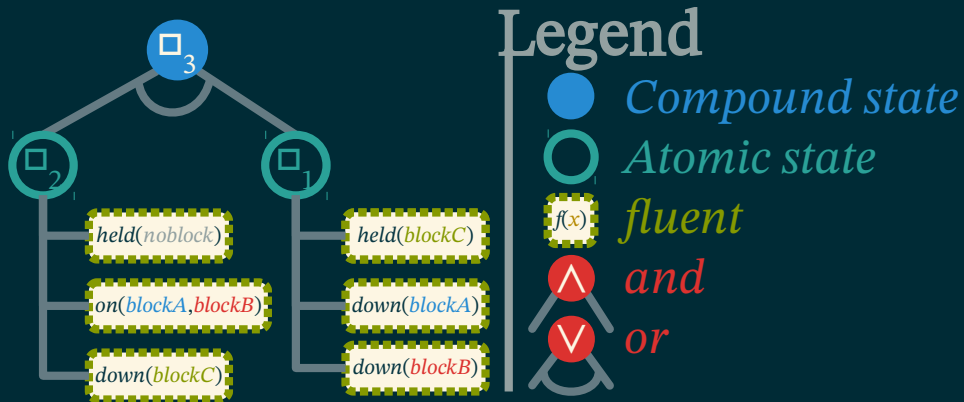


4 Formalisme de Planification Générale

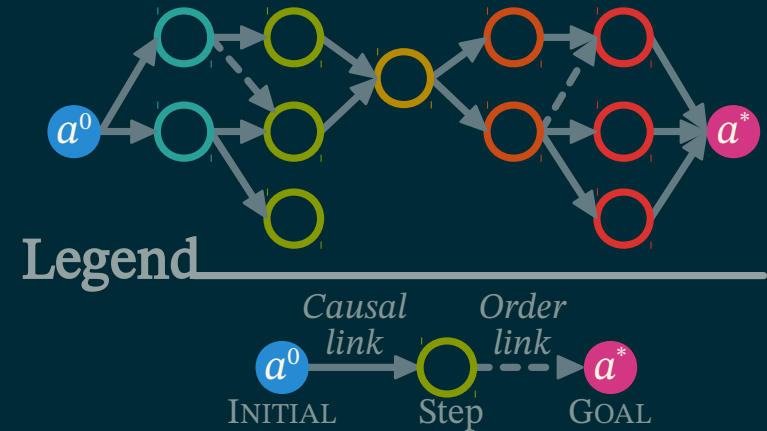
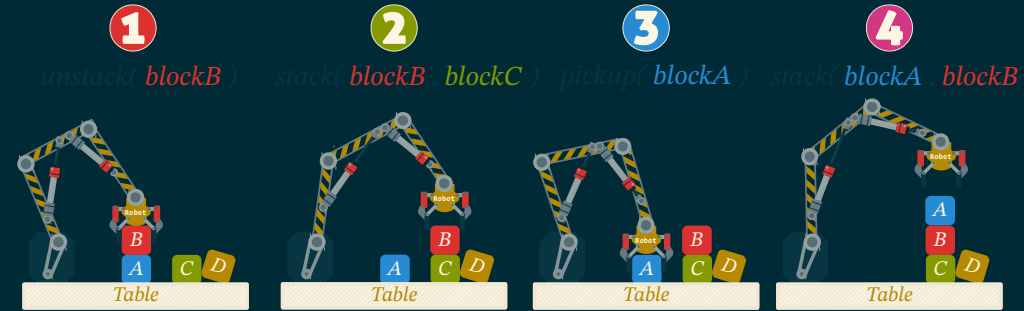


Domain

- Fluents
- États
- Action

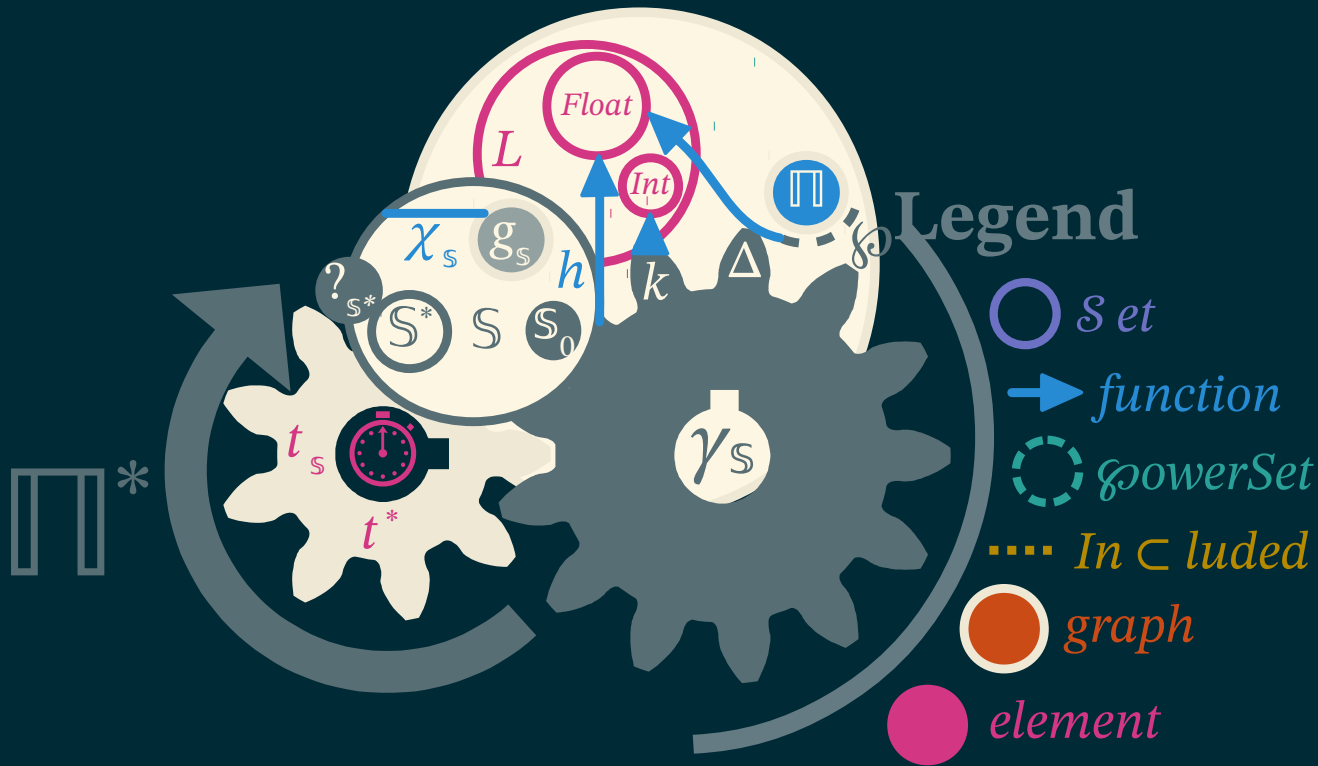


Problèmes et Solutions



Espace de Recherche

Algorithme général



Instances Classiques

5 Cadriciel COLOR



PDDL et Autre Langages

fluents

adl

object-fluents
numeric-fluents

action-costs
durative-actions

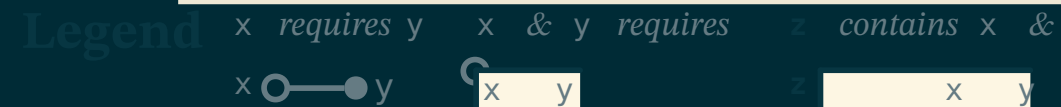
duration-inequalities
continious-effects
timed-initial-literals

strips
equality
typing
negative-preconditions
disjunctive-preconditions
quantified-preconditions

existential-preconditions
universal-preconditions

conditional-effects

derived-predicates constraints preferences



Le Cadriciel COLOR

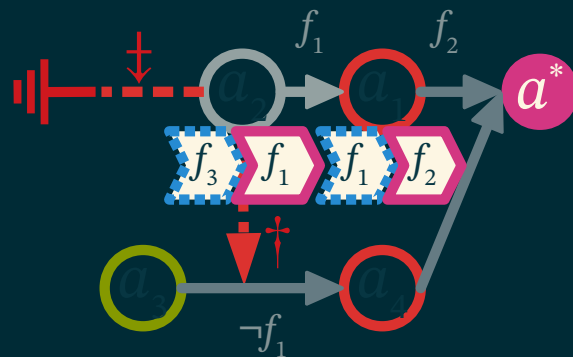
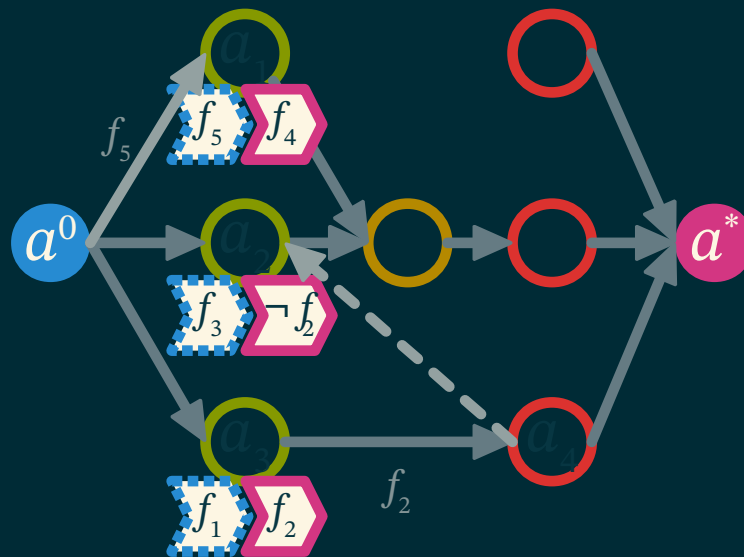
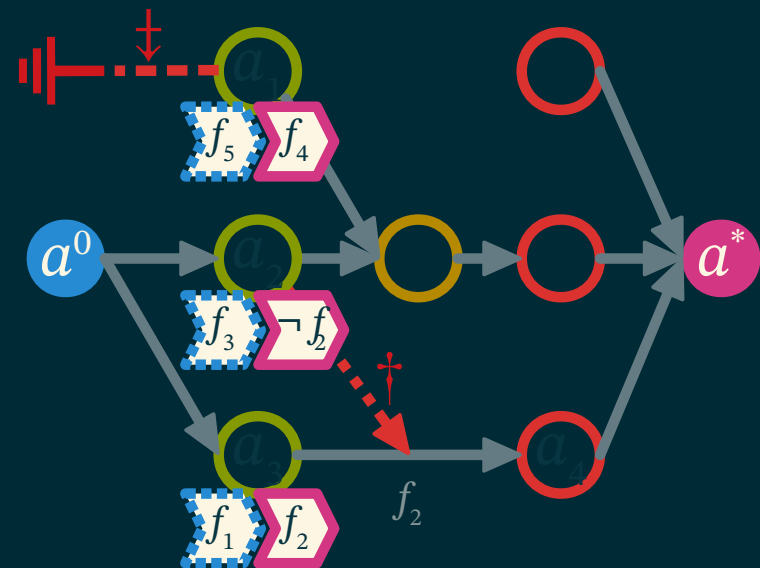
6 Algorithmes de Planification Temps-réel et Flexible



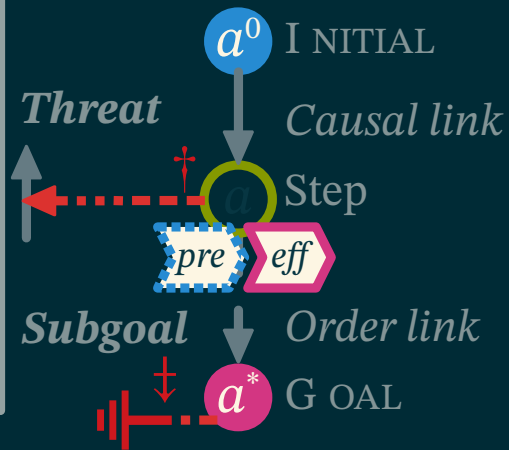
Algorithmes Existants

- Espace de Plan
- HTN

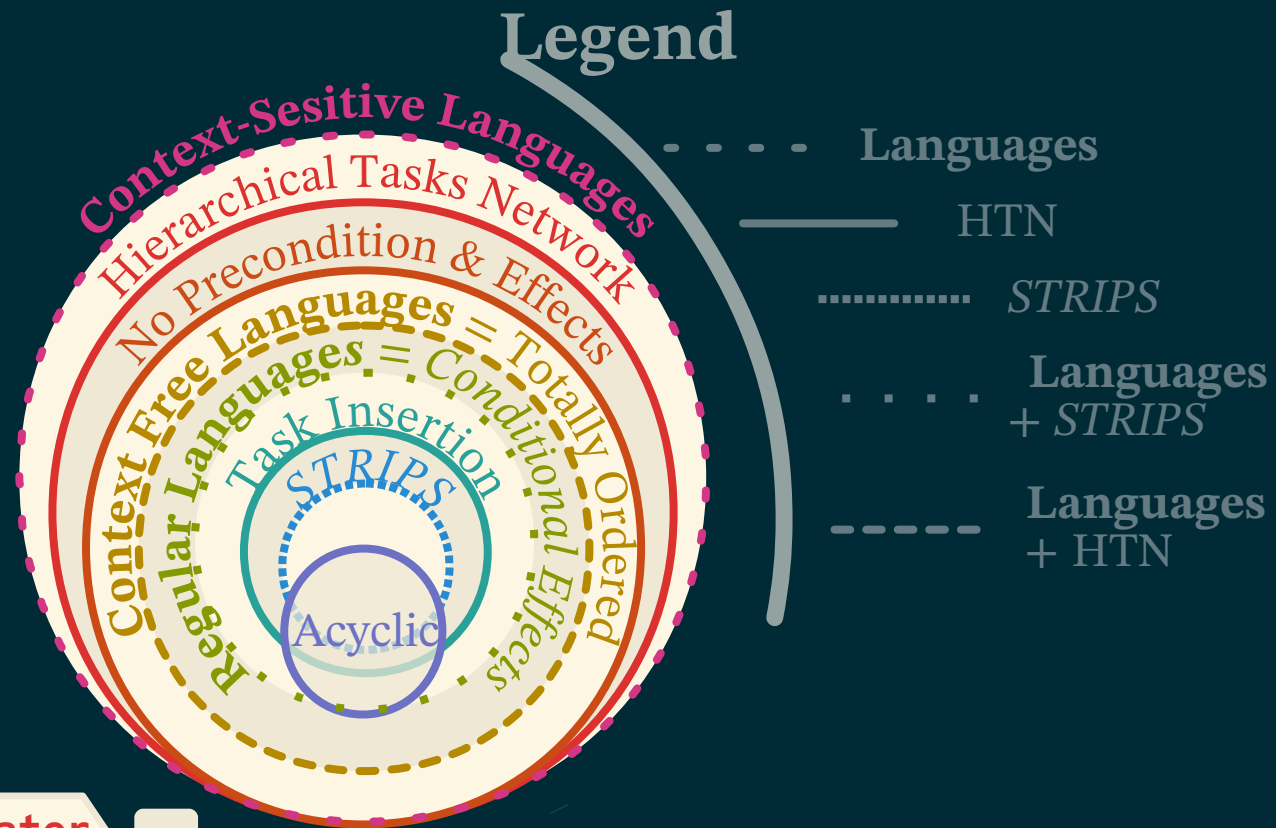
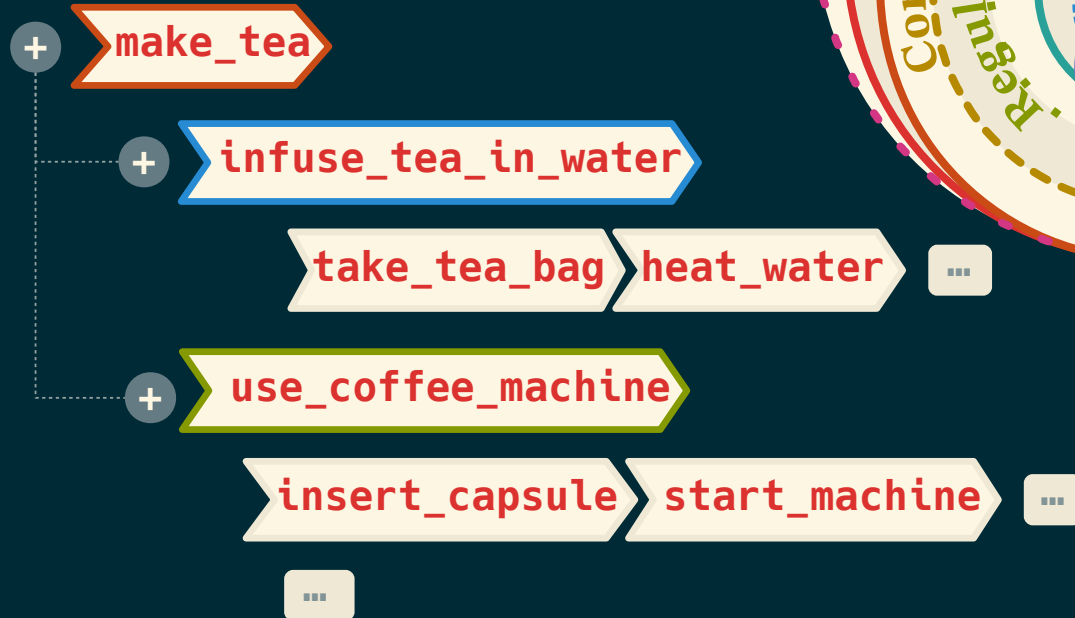
PSP



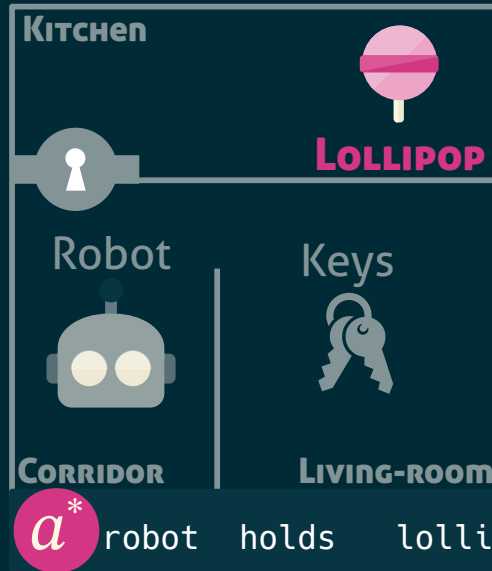
Legend



HTN



LOLLIPOP

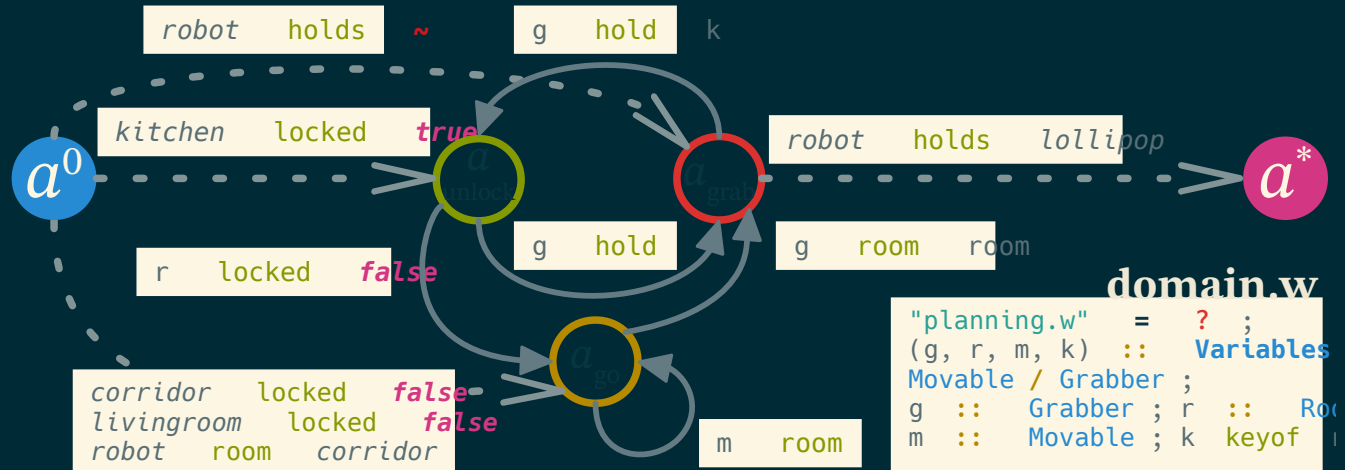


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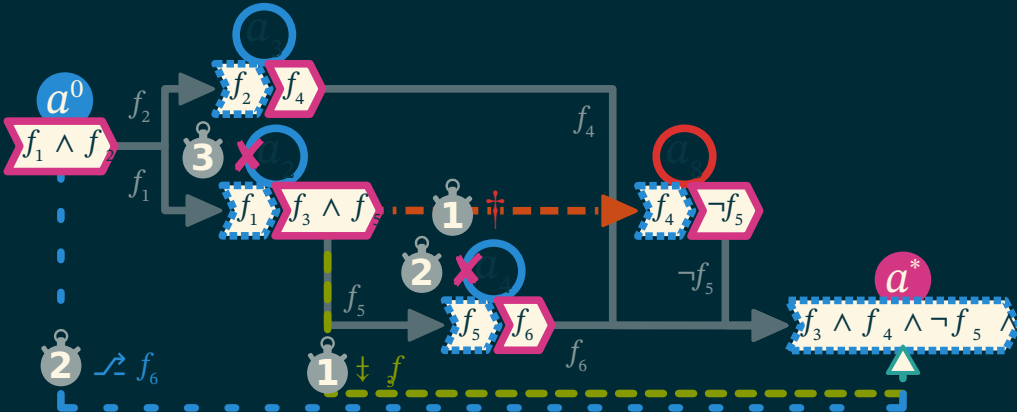
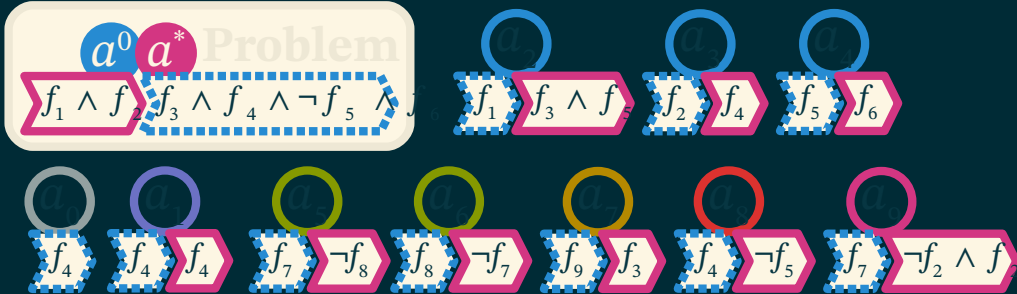
go (?movable, ?room)
  ?movable is Movable, ?room is Room
pre ?movable room != ?room,
  ?room locked false
eff ?movable room ?room

grab (?graber, ?pickable)
  ?graber is Grabber, ?pickable is Pickable
pre ?graber holds nothing,
  ?graber room = ?pickable room
eff ?graber holds ?pickable

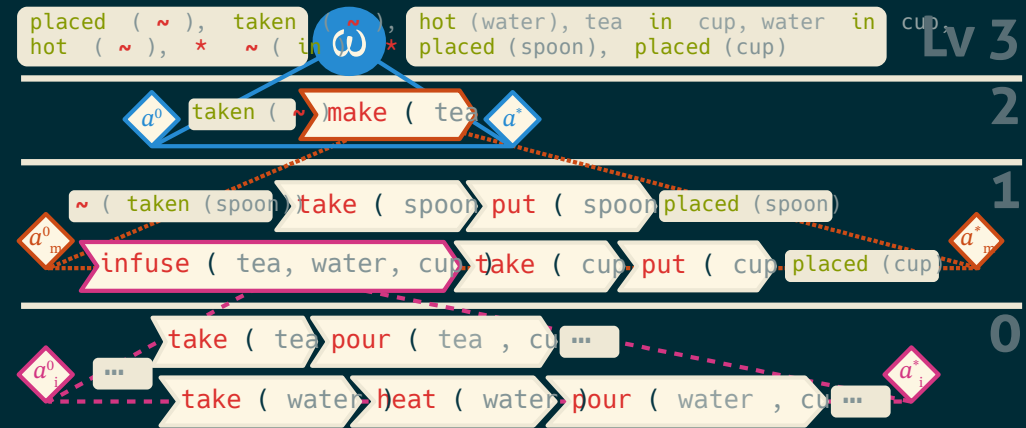
unlock (?graber, ?room)
  ?graber is Grabber, ?room is Room
pre ?room locked, ?graber holds key
eff ?graber holds nothing,
  ?room locked false
  
```



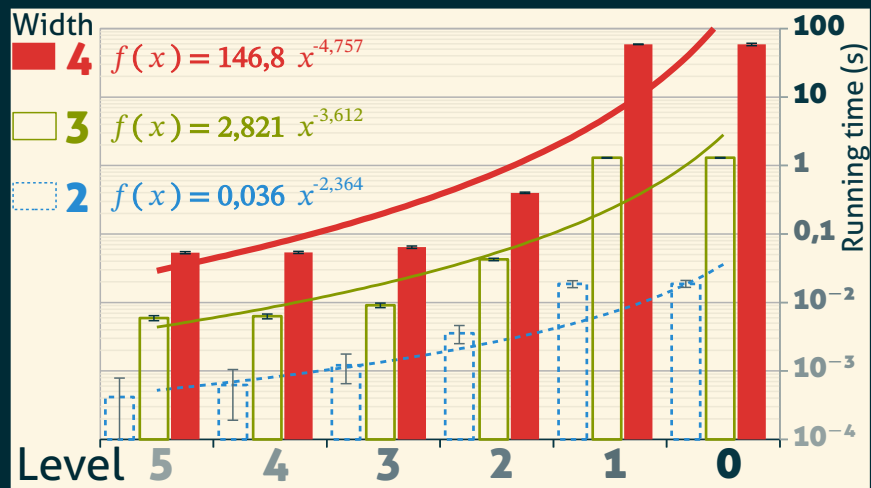
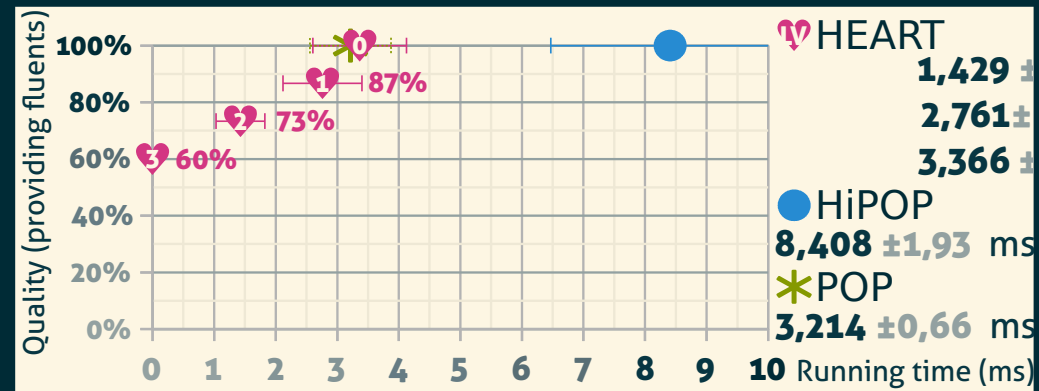
Résultats



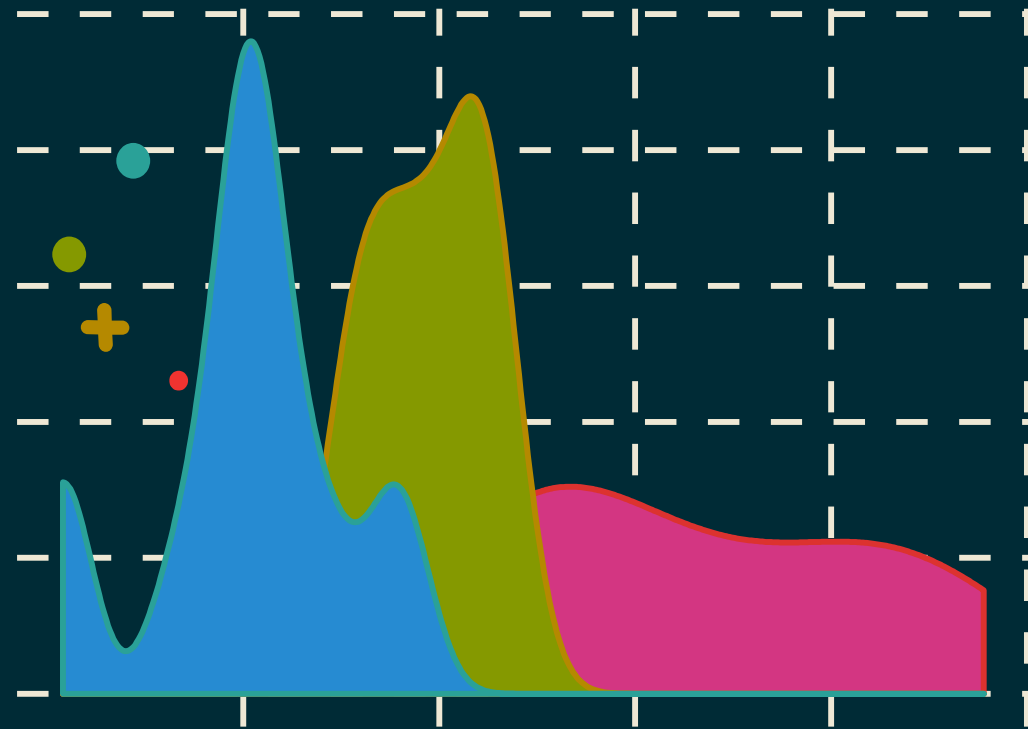
HEART



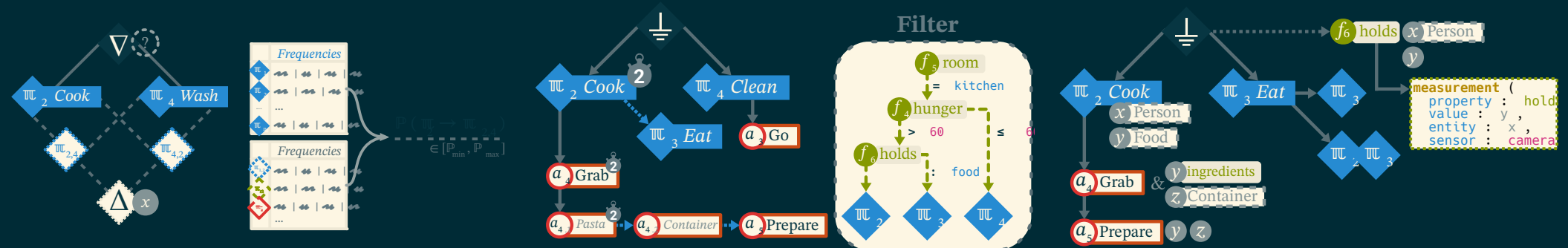
Résultats



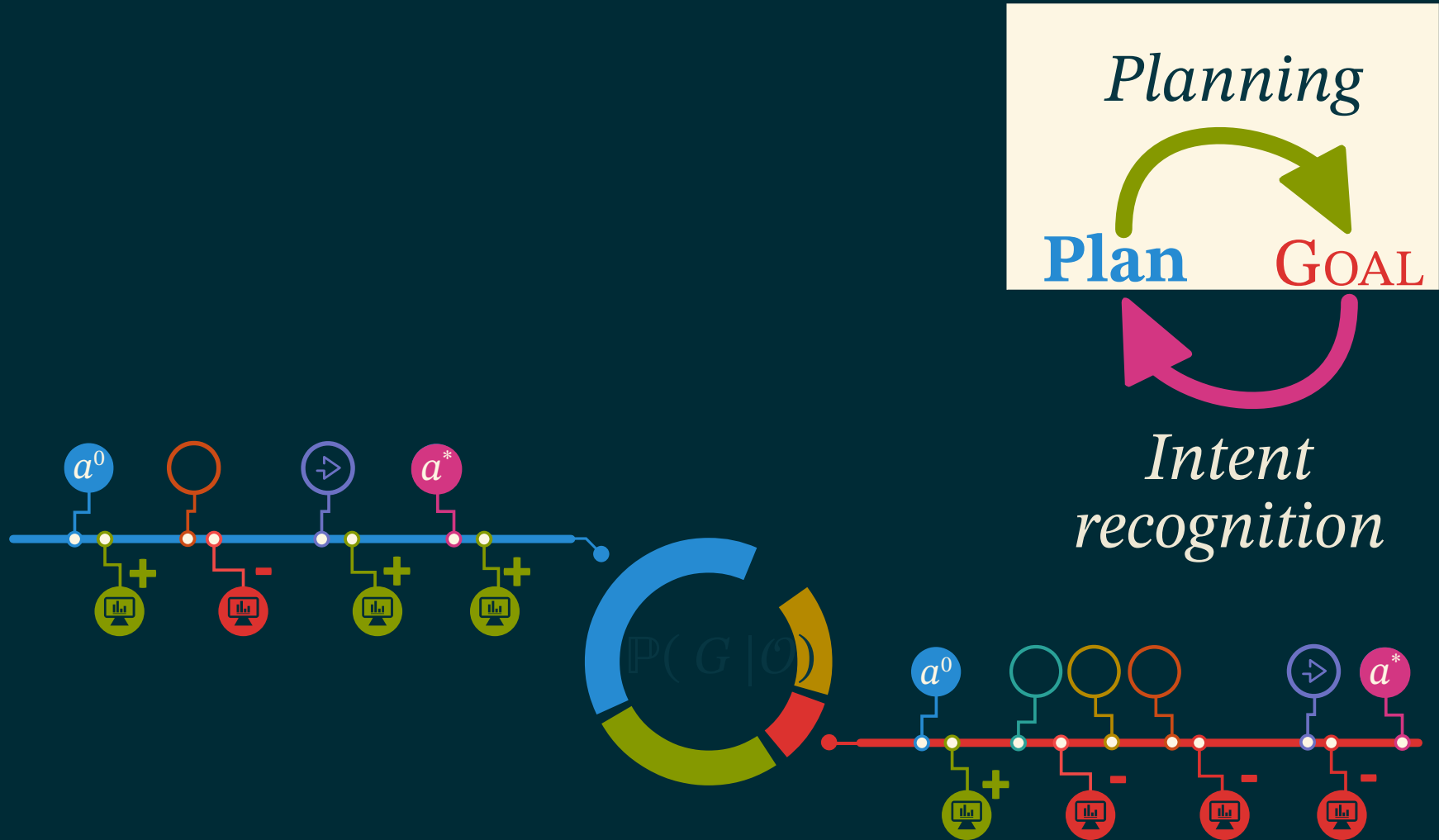
7 Vers la Reconnaissance d'Intention



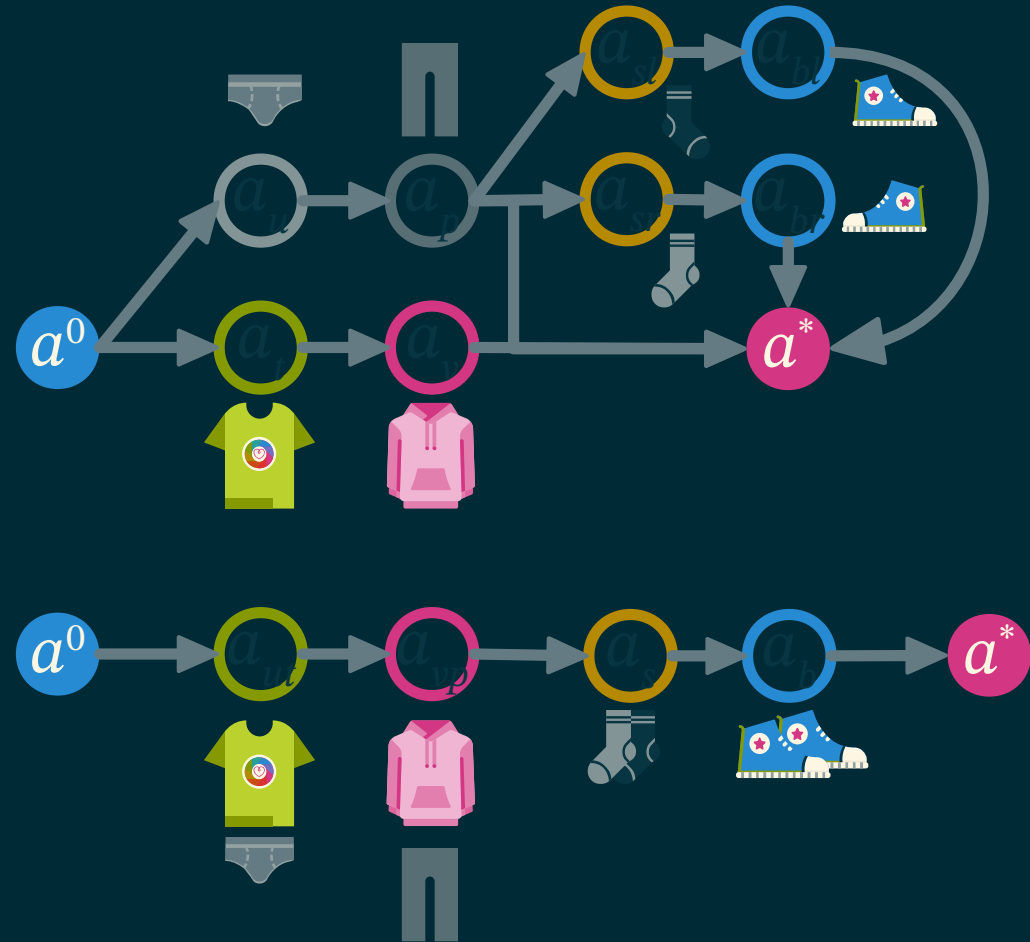
Approches Classiques



Planification inverse



Adaptation de HEART



8 Conclusion

Merci de votre écoute !

