Semantics Knowledge Representation using Advanced Object-Oriented Techniques
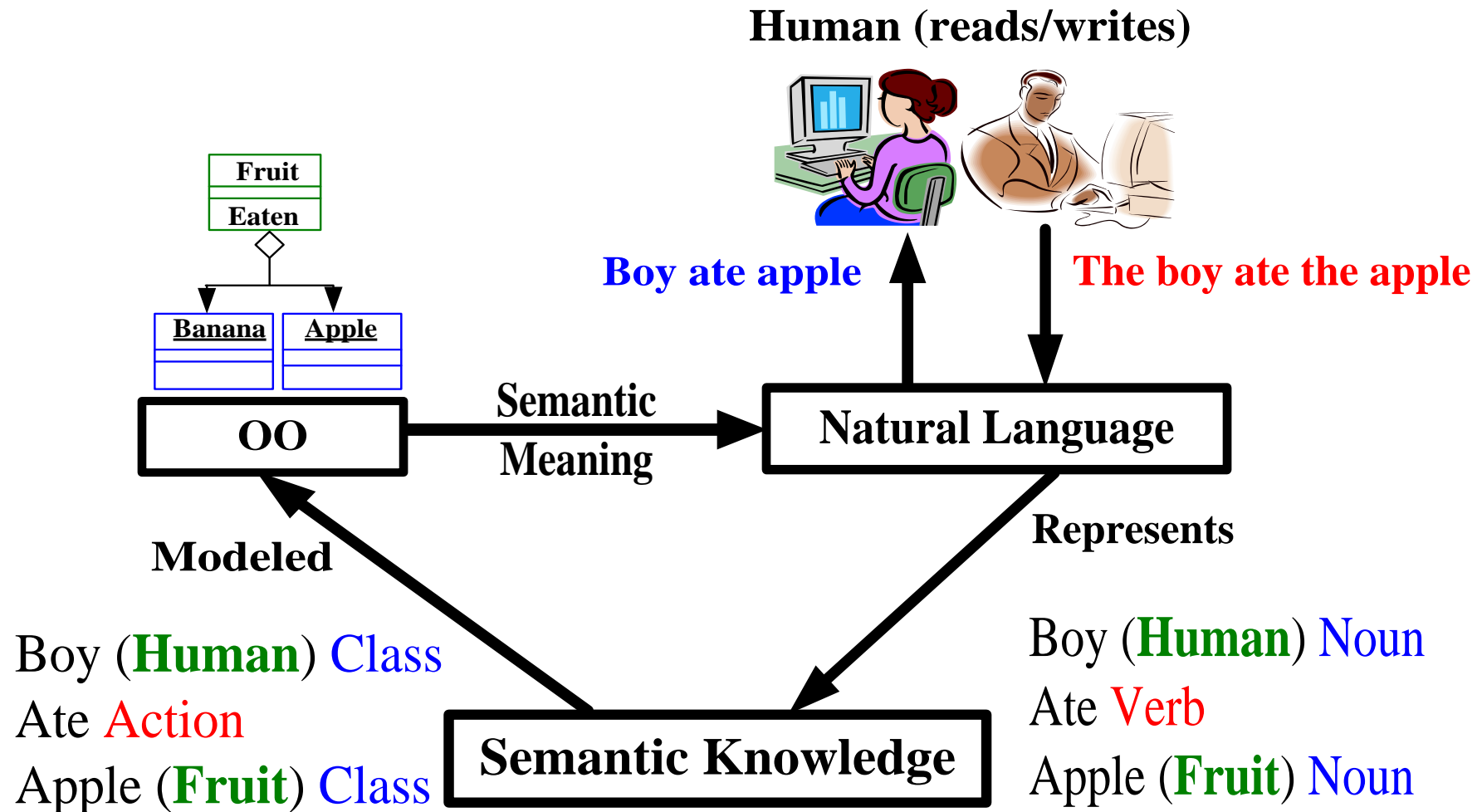
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Research Objectives
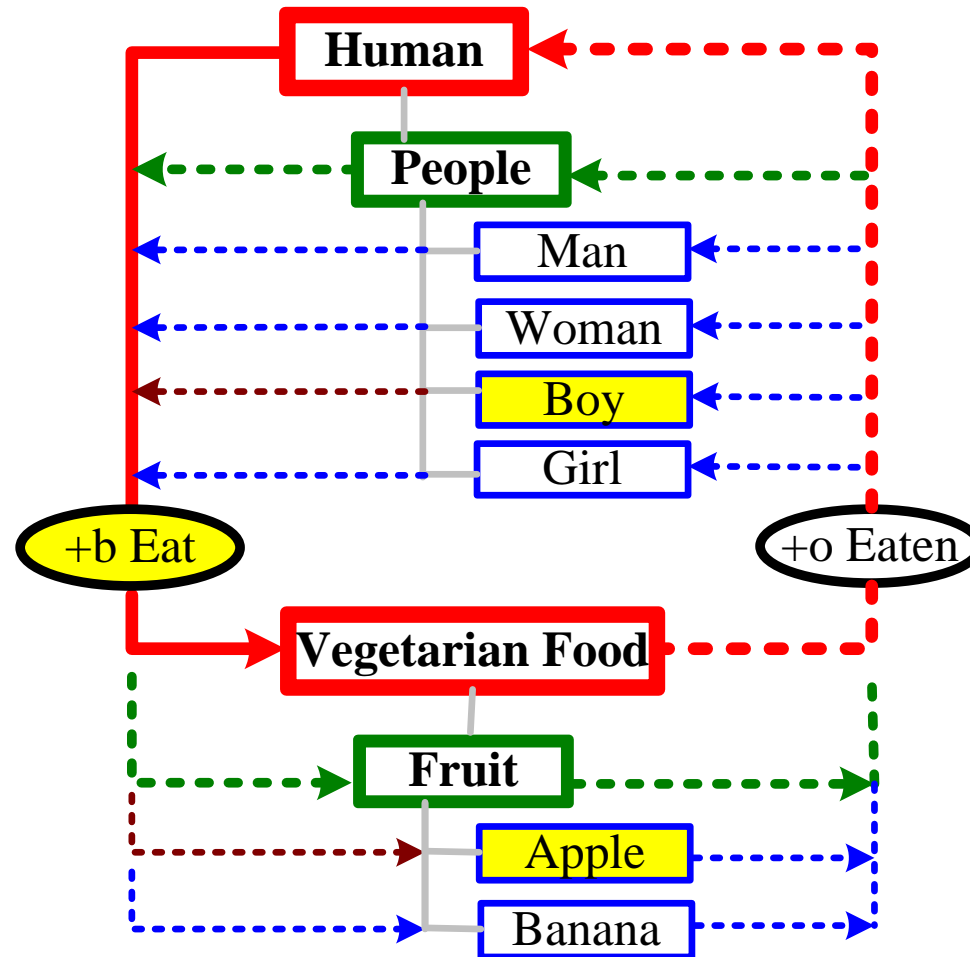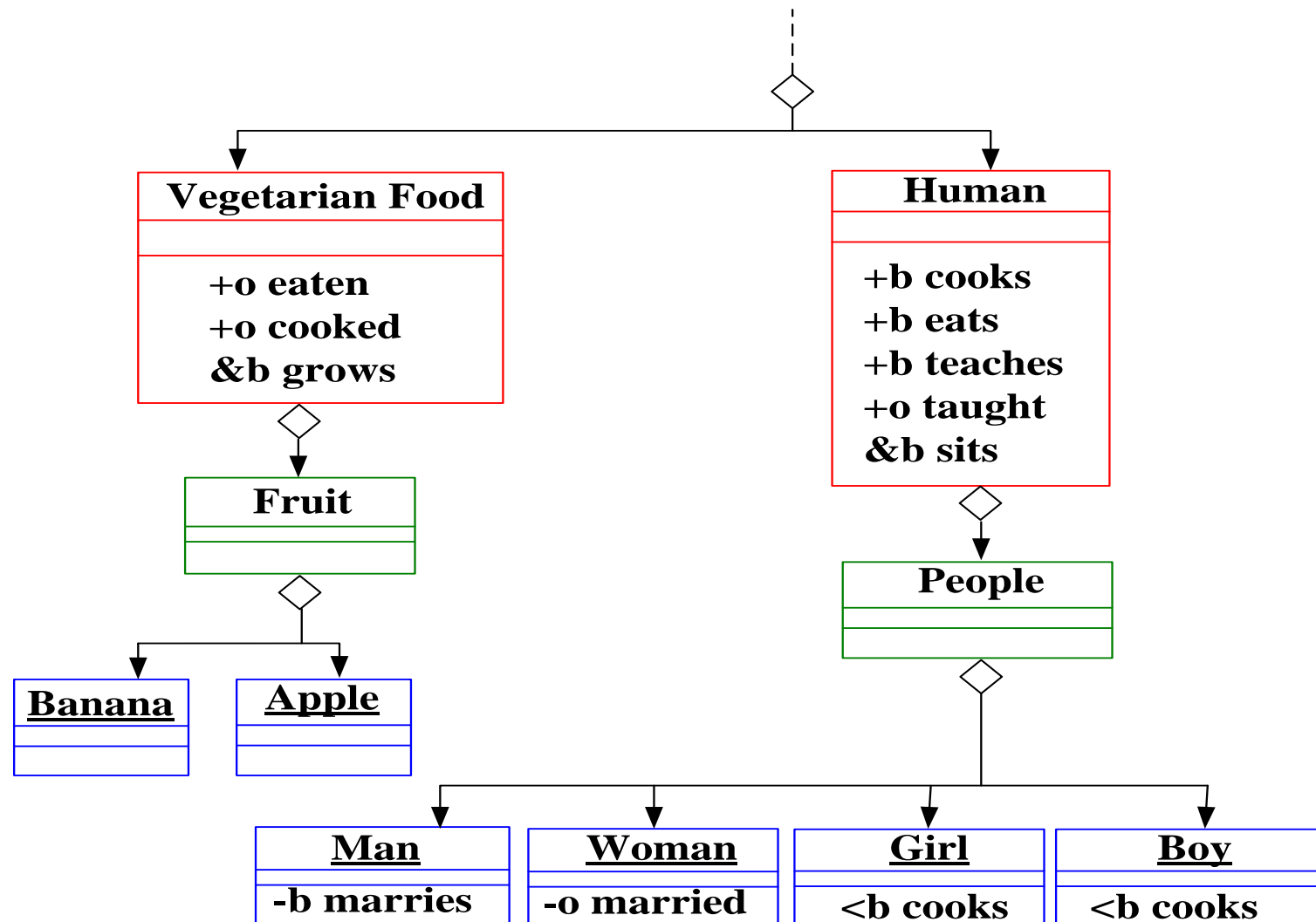
- **Using Object-Oriented (OO) techniques for semantic knowledge representation**

- **Showing how simple language phrases can be represented, generated and validated using enhanced OO**

- **Making enhancements and additions to OO UML**
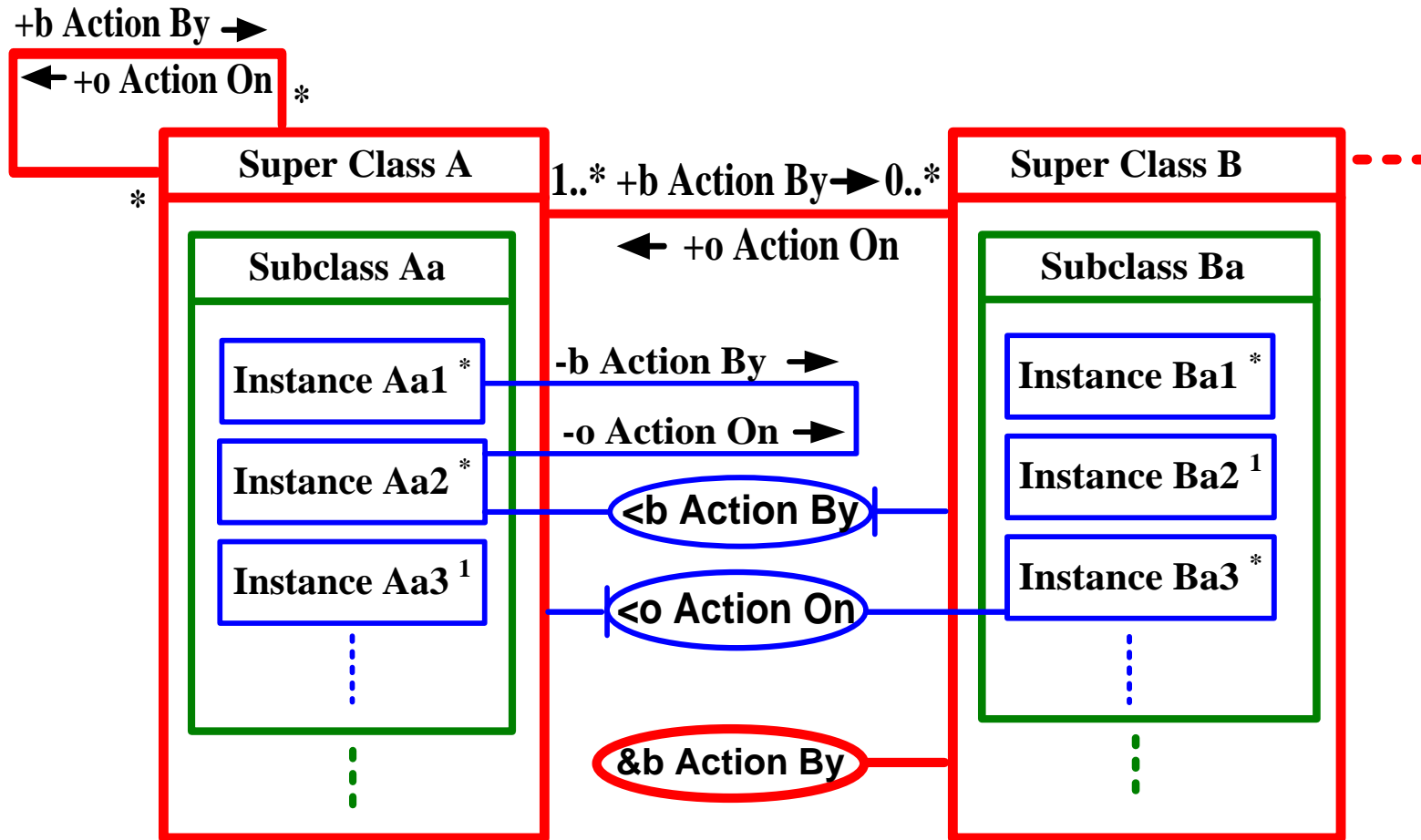
Semantics Knowledge Representation

Human (reads/writes)

Boy ate apple   **The boy ate the apple**

Fruit
Eaten

Banana   Apple

OO   **Semantic Meaning**   **Natural Language**

Modeled   **Represents**

Boy (**Human**) Class
Ate Action
Apple (**Fruit**) Class

Semantic Knowledge

Boy (**Human**) Noun
Ate Verb
Apple (**Fruit**) Noun

The simple phrase: Boy eats apple

UML (Part of SEMANTIC ENGLISH)

Enhanced UML (Meta Diagram)

Enhanced UML (Part of SEMANTIC ENGLISH)

Semantic Checking

Boy eats apple

This simple phrase is grammatically and semantically correct
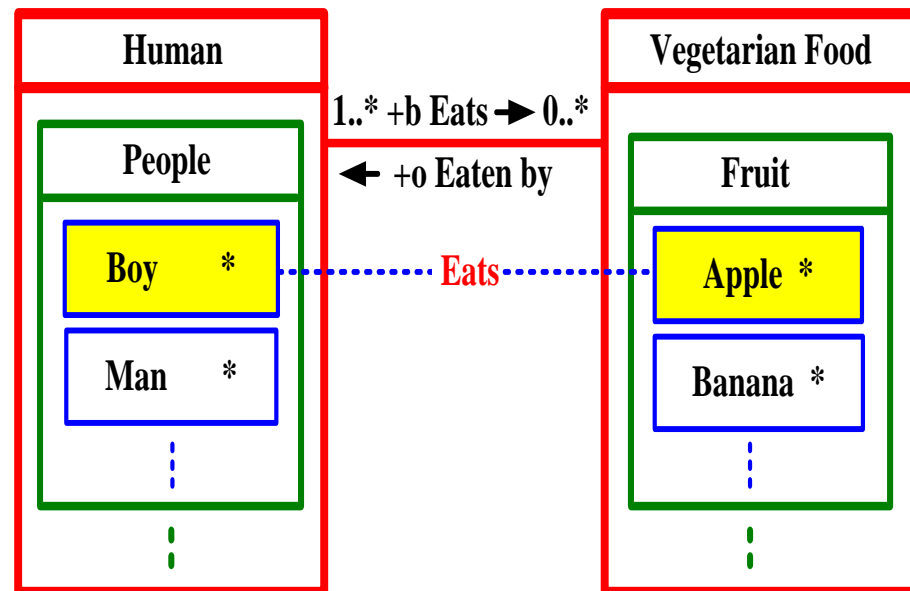
Because boy is Human

And apple is vegetarian food

And human can eat vegetarian food

Thus boy can eat apple

Then boy eats apple

Apple eats boy

This simple phrase is grammatically correct but semantically incorrect
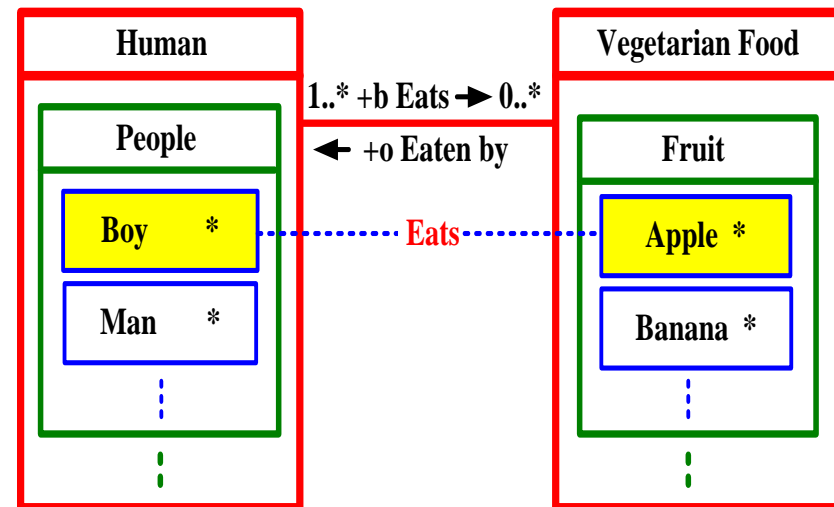
Because boy is Human

And apple is vegetarian food

And vegetarian food can't eat human

But human can eat vegetarian food

Thus boy can eat apple

Then boy eats apple

Conclusion

- **Proved that OO can be used for representing simple English phrases semantics**

- **This research is the first to effectively use the OO concept and enhance UML to deal with English language semantics for simple phrases.**

- **SEMANTIC ENGLISH is an intelligent OO eLearning system based on advanced UML**

Thank you