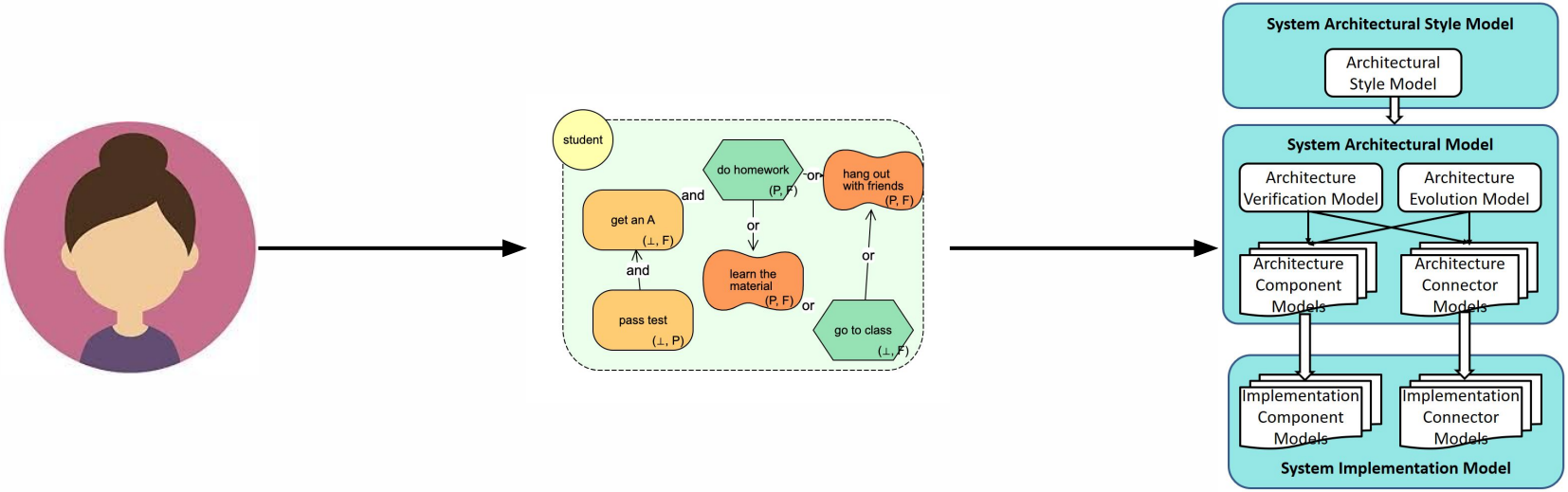
An Assistive Approach for Learning Goal Modeling

Karenna Kung and Alicia M. Grubb

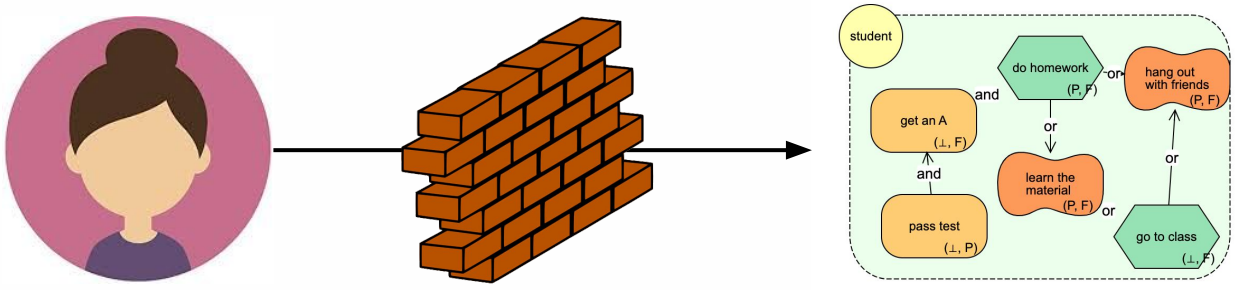
Smith College

Context



Wu, Di & Ban, Xiaojuan & Wang, Hao. (2017). COSE: A Composable Ocean Simulation Environment.

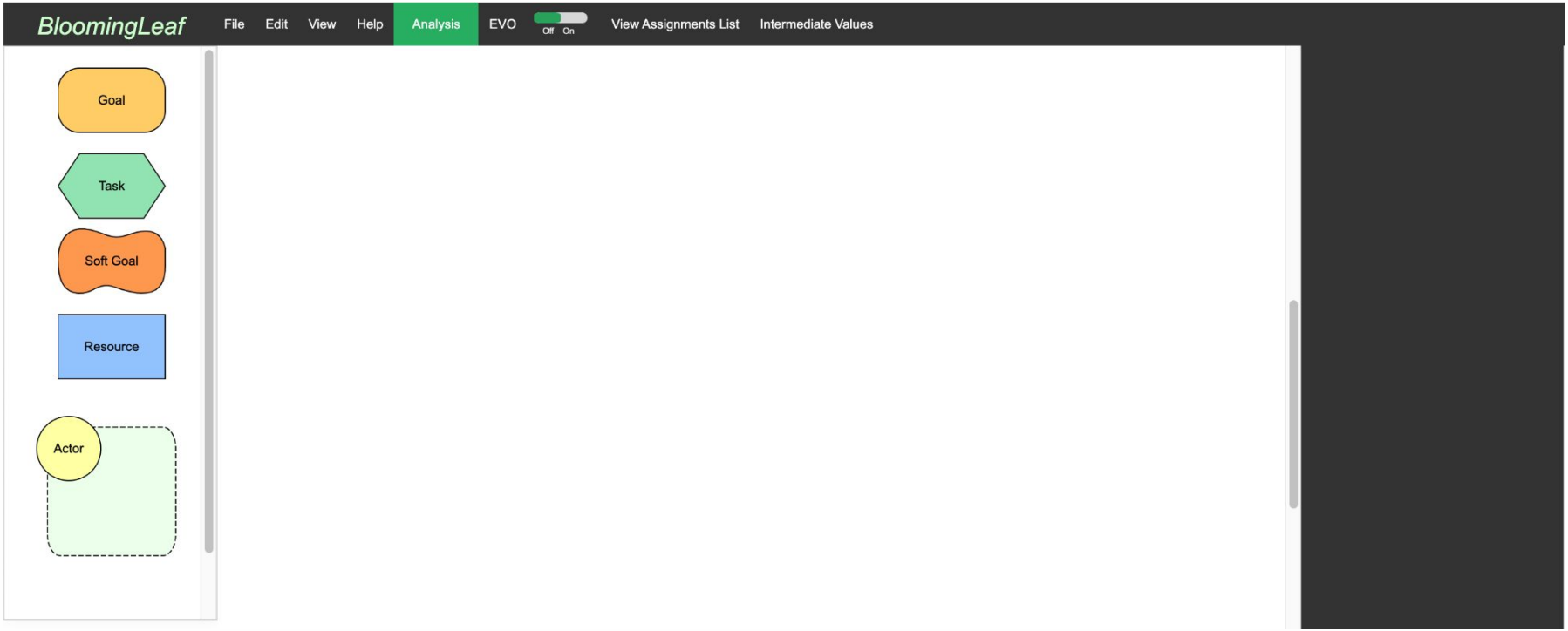
Problem



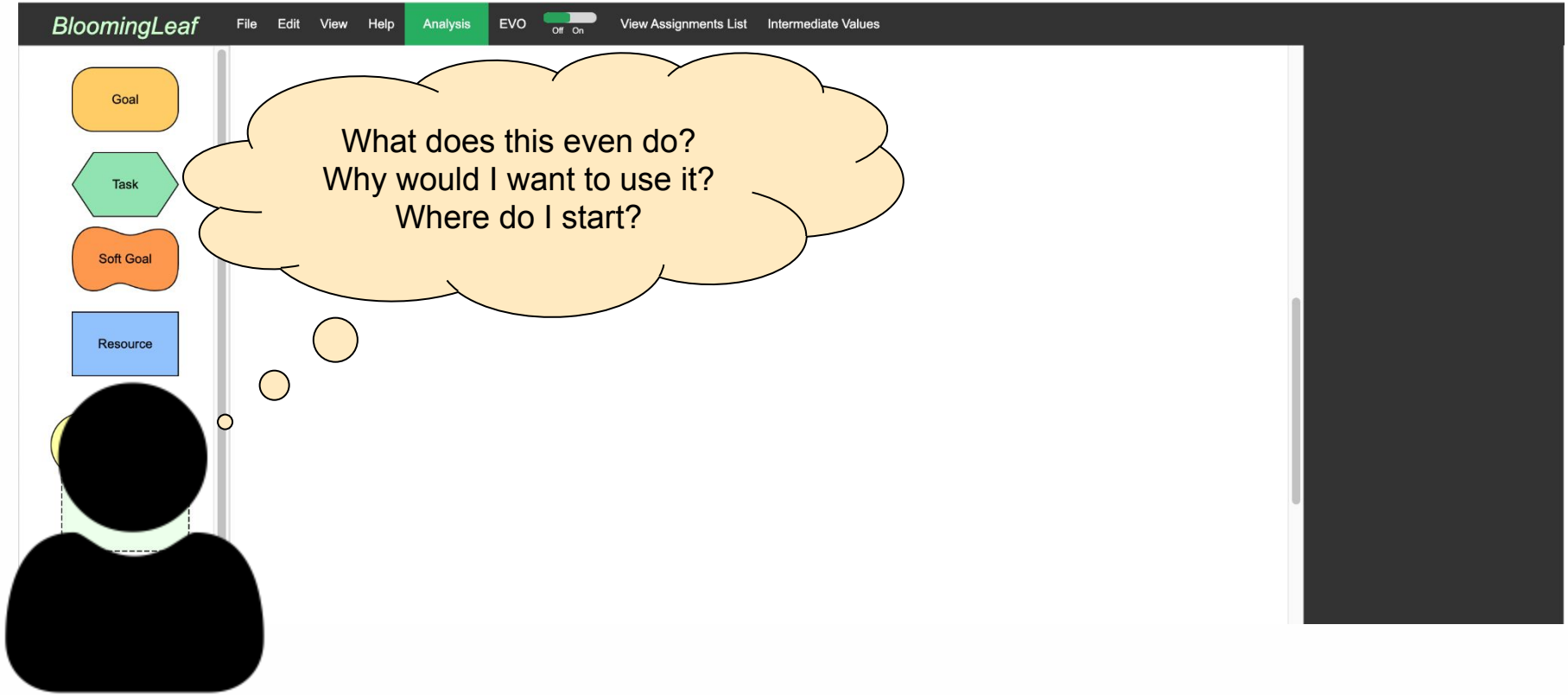
stakeholder

- Complexity of tooling
- Lack of available training
- Difficulty understanding models

Previous State



Previous State



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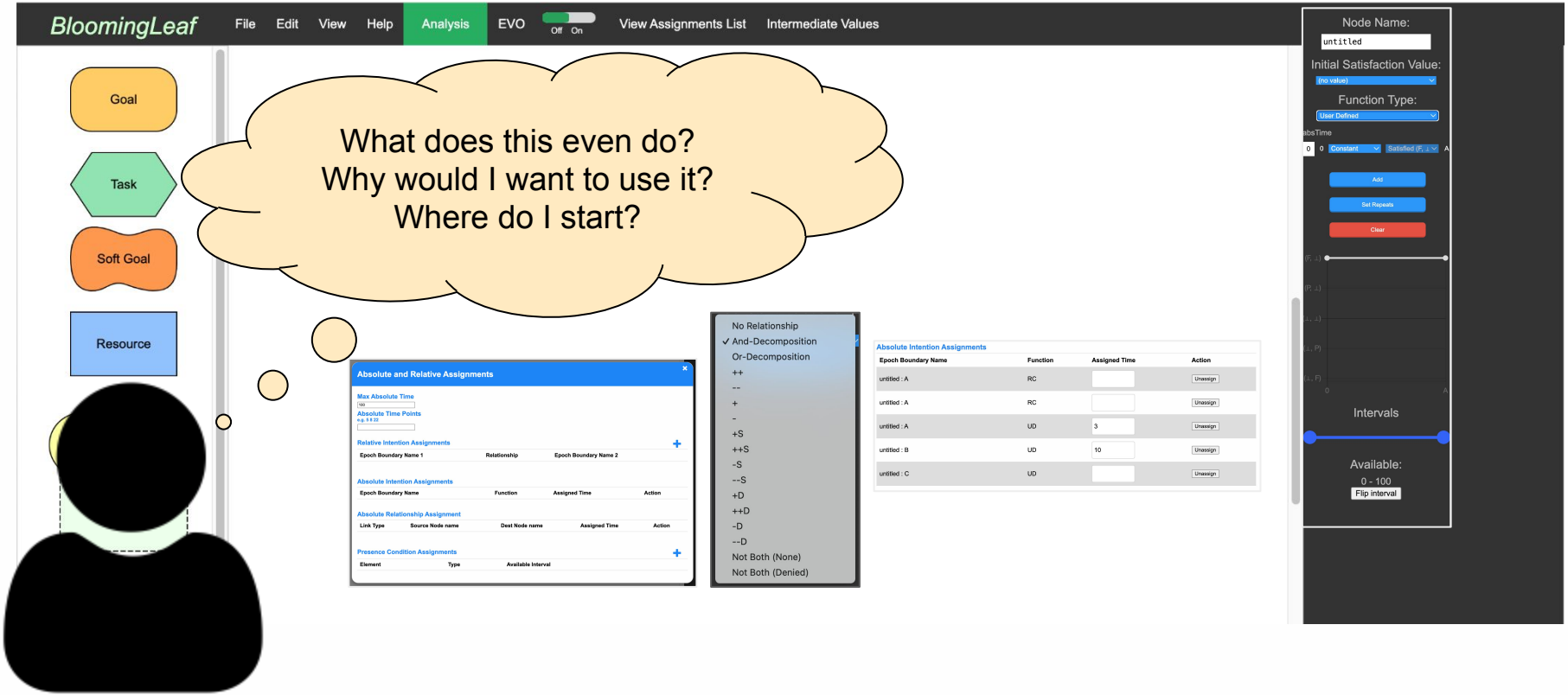
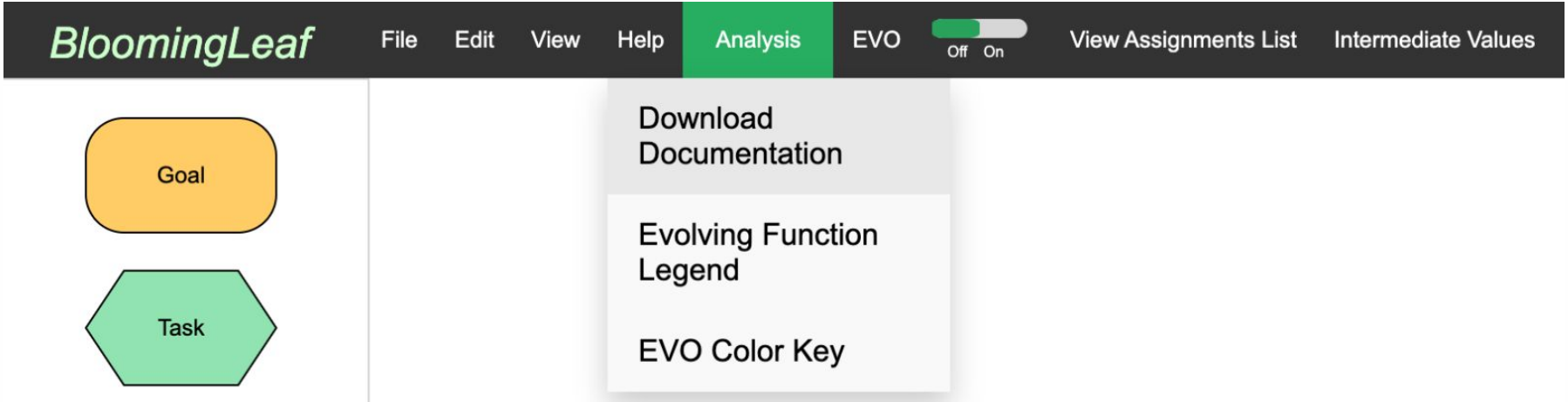


Previous State



Previous State

Introduction to Goal Modeling in TROPOS

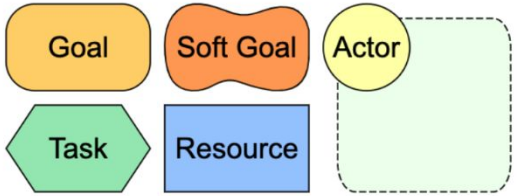
1 / 12 100%

1

2

Goal Modeling and Blooming Leaf Training

Intentions and Actors:



Goal models consist of actors and intentions

Types of intentions are goals, soft goals, tasks, and resources

Tropos Evidence Pairs:

Fully Satisfied	Partially Satisfied	None	Partially Denied	Fully Denied	Conflicting Evidence Pairs

Other Tools

IBM Rhapsody

Basic systems engineering design in Rhapsody®

Last Updated: 2025-06-06

This tutorial demonstrates how to apply a SysML profile to project, and how to design a basic structure and behavior.

Learning objectives

The tutorial demonstrates the following key concepts:
- Relationships of requirements to use cases
- Methods to define behavior
- Methods to define structure
- Relationships of required behavior to system architecture and validation approaches
- Techniques for handing off the project to software developers

> **Note:** The tutorial begins with a SysML model that contains some artifacts. You can use the *Spa and pool temperature control architecture* model to start working with this tutorial.

Time required

4 hours
- **Introduction: Basic systems engineering design in IBM Engineering Systems Design Rhapsody**
  The systems engineering tutorial starts with a SysML project containing artifacts for an outdoor spa pool temperature controller. Instructions and demonstrations help you to complete the simple architecture and hand it off to software engineers.
- **Tutorial setup: Downloading the starting point project**
  In this lesson, you download the starting point project for the tutorial and open it.
- **Lesson 1: Analyzing requirements**
  In this lesson, you view a short tour of the requirements and requirements table and edit the project.
- **Lesson 2: Tracing requirements in use cases**
  In the previous lesson, you reviewed the requirements and learned the difference between functional and nonfunctional requirements. This lesson contains a short video showing the use cases in the starting point project and their relationships. Analysis of the use cases gives you information about both the structure and the behavior of the system.
- **Lesson 3: Creating standard value types**
  Most of the attributes have already been added to the SystemUnderControl block. In this lesson, you add the mass of the water to the block. Since the mass of water is expressed in kg, you begin by specifying an applicable

Catia MagicDraw

User Guide

Welcome! This user guide will walk you through the basics of using the modeling tool, including working with projects, setting up the modeling environment, collaborating with the help of Teamwork Cloud, generating reports, and more.

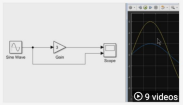
Use the search box to find a specific topic or select one from the list below:

- Getting started
- Working with projects
- Authentication with 3DEXPERIENCE platform
- CATIA applications
- Diagrams
- Diagramming
- UML elements
- Auxiliary diagram symbols
- Working with model elements
- Tools
- Model analysis
- Collaborative modeling
- Report Wizard
- Exchanging data between tables and Excel or CSV files

MATLAB Simulink

Getting Started with Simulink for a Control System

Getting Started with Simulink for Signal Processing



How to Build a Simulink Model Step by Step (9 videos)

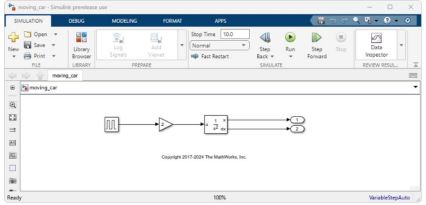
Create a Simple Model

R2025a

You can use Simulink® to model a system and then simulate the dynamic behavior of that system. The basic techniques you use to create a simple model in this tutorial are the same as those you use for more complex models. This example simulates simplified motion of a car. A car is typically in motion while the gas pedal is pressed. After the pedal is released, the car idles and comes to a stop.

A Simulink block is a model element that defines a mathematical relationship between its input and output. To create this simple model, you need four Simulink blocks.

Block Name	Block Purpose	Model Purpose
Pulse Generator	Generate an input signal for the model	Represent the accelerator pedal
Gain	Multiply the input signal by a constant value	Calculate how pressing the accelerator affects the car acceleration
Second-Order Integrator	Integrate the input signal twice	Obtain position from acceleration
Outport	Designate a signal as an output from the model	Designate the position as an output from the model



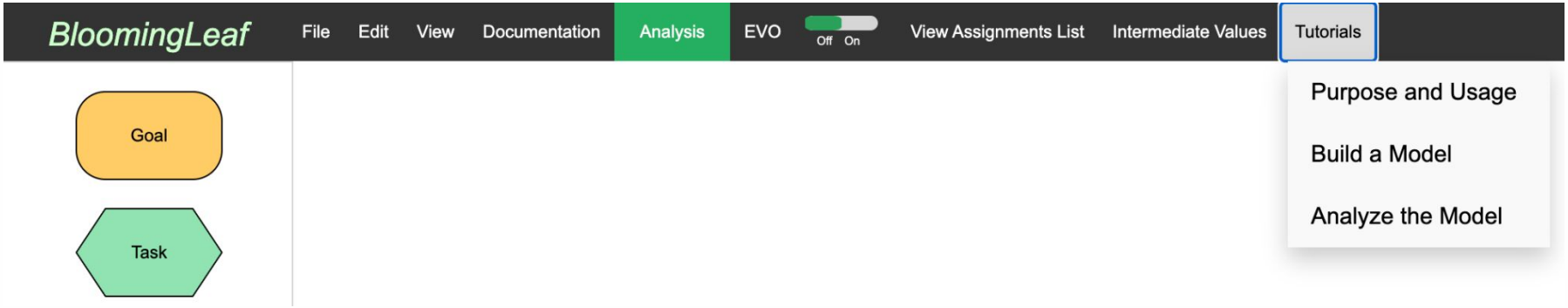
Simulating this model integrates a brief pulse twice to get a ramp. The input pulse represents a press of the gas pedal: 1 when the pedal is pressed and 0 when it is not. The output ramp is the increasing distance from the starting point.

Open New Model

Use the Simulink Editor to build your models.

1. Start MATLAB®. From the MATLAB toolstrip, click the **Simulink** button

Proposed Solution



Easily accessible tutorials embedded in the tool
Navigable step-by-step or as-needed
Including development of example model

Tutorial Content

Uncertainties reported by novice user

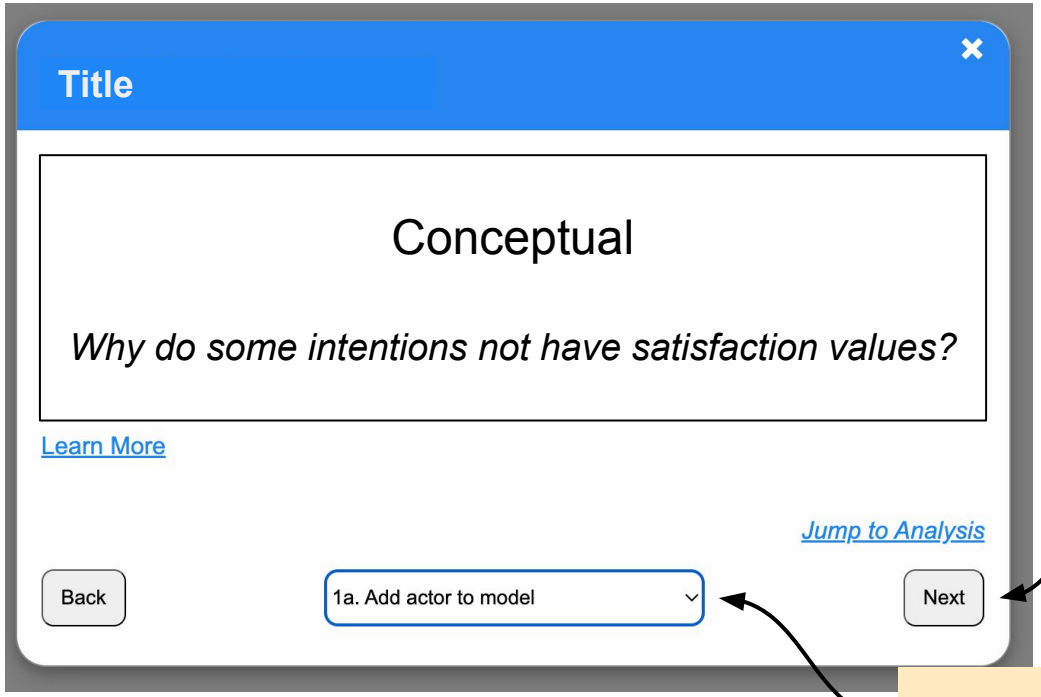
Novice user example questions:

	Mechanical	Conceptual
General Modeling:		What is the point of BloomingLeaf?
Creating:	Link button is not intuitive	Why do some intentions not have satisfaction values?
Analyzing:	When do EVO colors show up?	How to decide number of time points, what time frame do time points symbolize

Tool Structure - Build

Mechanical

Link button is not intuitive



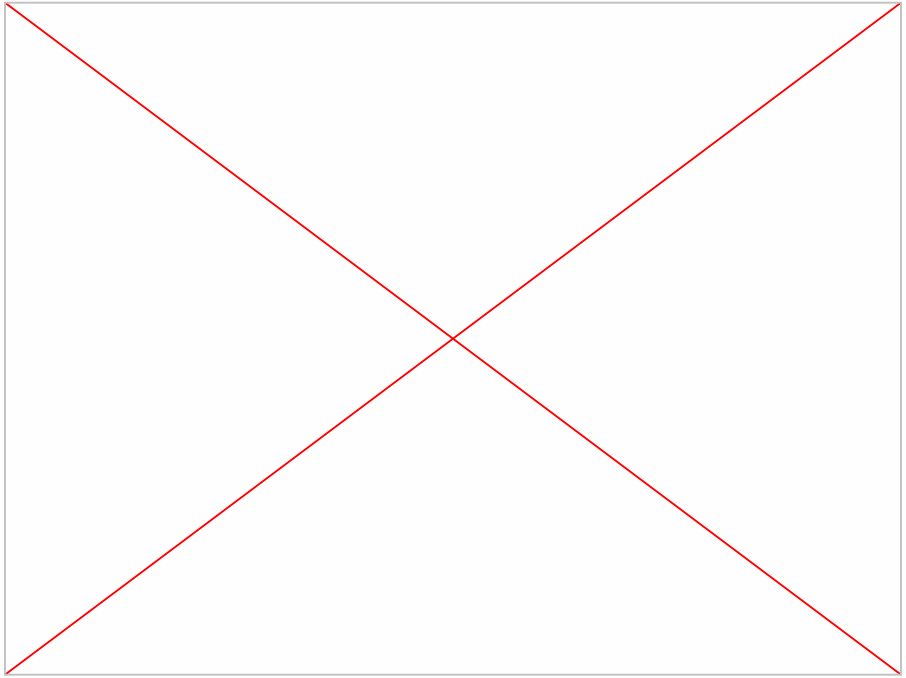
Step-by-step

As-needed

Tool Structure - Build

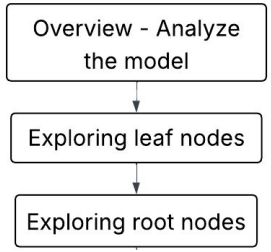
1. Create the model
1a. Add actor to model
1b. Use actor inspector
1c. Add intentions to the model
1d. Use intention inspector
1e. Link intentions

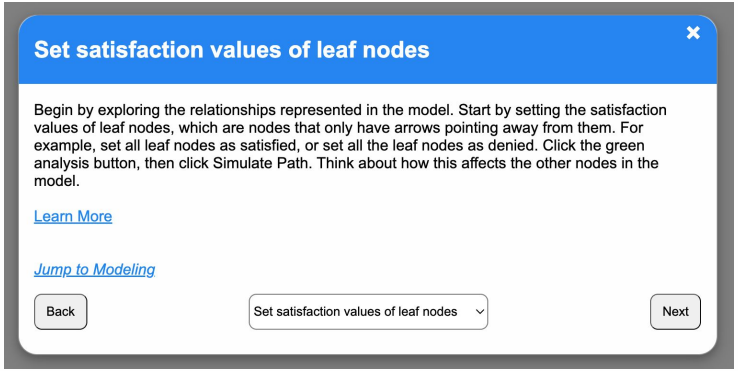
2. Adding evolutionary information
2a. Set initial satisfaction value
2b. Set evolving functions
2c. Limit presence intervals
2d. Change max absolute time
2e. Set absolute time points
2f. Set relative intention assignments
2g. Set absolute relationship assignments
2h. Change presence intervals
2i. Use intermediate values table



Tool Structure - Analyze

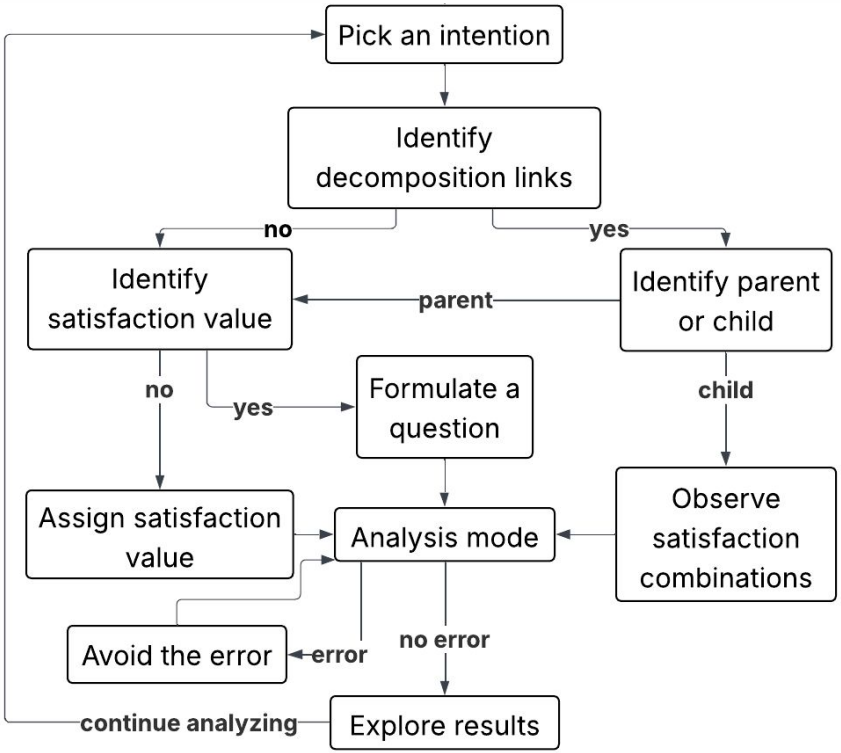
1





Tool Structure - Analyze

2



Plan for Validation

8-16 participants

Original tool

With tutorials

Build model

- Tracking mouse clicks in documentation and tutorials
- Answer comprehension questions
- Rate difficulty
- Report points of confusion

Thank You

Thank you to Molly Daniel and Christine Dong for their contributions to this project.

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