FreeCAD Beginner Assistant

The Psychology of Bolt

What is Bolt?

Bolt is a virtual assistant for FreeCAD beginners. While you create your projects in FreeCAD, it interactively gives you hints, teaching you best practices through state of the art learning methods from psychology.

Best practices include:

- Order of operations
- Preferency of certain operations over others
- Optimal parameters for operations

Goal

By teaching best practices to FreeCAD users, the quality of projects made in FreeCAD increases and makes FreeCAD more popular in the industry.

The ultimate goal is to make FreeCAD the default 3D CAD software for product development, especially für machine builders.

ALSADO

Methods of Learning

There are several learning methods known in psychology:

- Classical conditioning
- Operant conditioning
- Observational learning
- Insight Learning
- Learning through habituation and sensitization

Bolts' learning effectiveness can improve by using multiple learning methods simultaneously, potentially tailored to the user's personality. Alternatively, analyzing the distribution of personalities in the FreeCAD community could help select the most suitable method. Examining personality disorders might also provide insights into which methods suit different personalities.

As a starting point, Bolt will utilize **operant conditioning** as a learning method.

Operant Conditioning

Operant conditioning shapes the FreeCAD user behavior through rewards or consequences involving reinforcement or punishment.

Type	Definition	Effect
Positive reinforcement	Pleasant stimulus follows desired behavior	Increases the probability of the desired behviour
Negative reinforcement	Removing a unpleasant stimulus after desired behaviour	Increases the probability of the desired behviour
Positive punishment	Unpleasant stimulus follows undesired behaviour	Decreases the probability of the undesired behviour
Negative punishment	Removing a pleasant stimulus after undesired bahaviour	Decreases the probability of the undesired behviour

Types of stimuli in software

There are different stimuli for operant conditioning that Bolt can utilize to teach best practices to FreeCAD beginners:

- Visual stimulus (e.g. brightness, color, shape, movement)
- Auditory stimulus (pitch, volume)
- Verbal stimulus (tone of voice/ text)
- Non-verbal stimulus (body language, facial expression, gesture)
- Vestiubular stimulus (change in head position)

As of now, **visual, verbal and non-verbal stimuli** will be utilized by Bolt.

Story of Bolt

Coming up with a background story of Bolt and why he wants to teach FreeCAD will create empathy in its users and help its acceptance in the userbase:

“Once upon a time, in a tranquil forest where moonlight gently illuminated the trees, there lived an owl named Bolt. Every night, Bolt saw engineers struggling with the complexities of FreeCAD, feeling overwhelmed and lost. One day, Bolt decided to use his wisdom and patience to help them master the tool. As he guided them through their frustrations, they began to succeed and create wonders, transforming their doubts into achievements. And ever since, Bolt has continued his mission, finding joy in every engineer’s newfound confidence and skill.”

The Psychology of Bolt, the FreeCAD Beginner Assistant

This overview showcases the development process from a macro perspective, starting off with established methods of learning known from psychology, to teach best practices to FreeCAD beginners.

What's next?
Next, the task is to further develop the character „Bolt" and allow him to use visual, verbal and non-verbal stimuli for his learning method operant conditioning.

Created by:
Aleksander Sadowski