KOMEGA REQUIREMENTS No.2, Version 1
Basic Application Scenario

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August 11, 2020

Abstract

This text describes the basic requirements for the komega software project, which is part of a larger project in the domain of an applied cultural anthropology. This is version 1 of the basic requirements No.2 which continues No.1-v3

1 Basic Application Scenario

In the basic application scenario in figure 1 the overall layout of the application is outlined.[1]

The main result of this analysis leads to the following concrete requirements:

1. Organize a process with *multiple phases*.
2. Every phase has its own *subset* $L_{0.i}$ of a natural language L_0 as reference set and it has to be clarified *which functions are needed* to be implemented in a TM functioning as a simulator for these texts.
3. The theory of *formal languages* associated with the *theory of automata* can perhaps be of some help, as well as some parts of *machine learning [ML]*.
4. But the main paradigm to be followed is the paradigm of the *automatic meaning device* AMD.

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[1] The details of this outline are documented here: `https://www.uffmm.org/2020/07/26/komega-requirements-no-1-basic-application-scenario/`

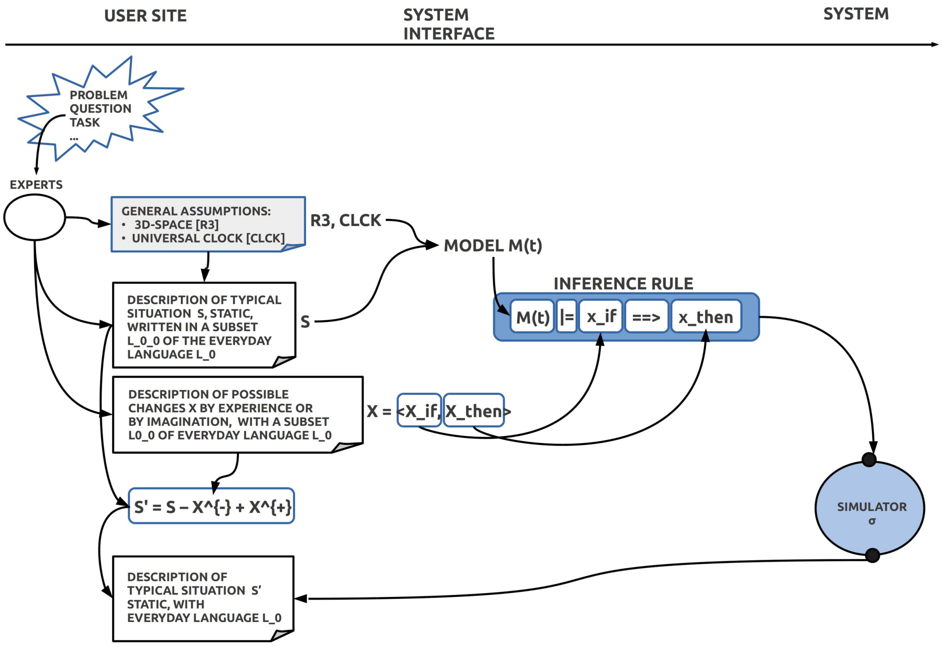
USER SITE
SYSTEM INTERFACE
SYSTEM
PROBLEM QUESTION TASK ...
EXPERTS
GENERAL ASSUMPTIONS:
• 3D-SPACE [R3]
• UNIVERSAL CLOCK [CLCK]
R3, CLCK
MODEL M(t)
INFERENCE RULE
M(t) |= x_if ==> x_then
DESCRIPTION OF TYPICAL SITUATION S, STATIC, WRITTEN IN A SUBSET L_0_0 OF THE EVERYDAY LANGUAGE L_0
S
DESCRIPTION OF POSSIBLE CHANGES X BY EXPERIENCE OR BY IMAGINATION, WITH A SUBSET L0_0 OF EVERYDAY LANGUAGE L_0
X = <X_if, X_then>
S' = S – X^{-} + X^{+}
SIMULATOR σ
DESCRIPTION OF TYPICAL SITUATION S' STATIC, WITH EVERYDAY LANGUAGE L_0

Figure 1: General framework for experts to share their experience in the format of a computer aided simulation-game

Here we focus on the requirements with the languages which are understood as subsets of a minimal set $L_{0.0}$ of some natural everyday language L_0. We try the following hypotheses:

1. $L_{0.0.0} \subset L_{0.0}$: Only *concrete* statements.
2. $L_{0.0.1} \subset L_{0.0.0}$: Additionally *time expressions*.
3. $L_{0.0.2} \subset L_{0.0.1}$: Additionally *spatial orientation*.
4. $L_{0.0.3} \subset L_{0.0.2}$: Additionally *common expressions (variables)* with finite but dynamic lists of *possible instances (constants)*.

2 Actor Story [AS] Overview

In the actor story the basic activities of the user of the system – generally a group of assumed experts – will be described as an assumed story of activities with the system.

The basic idea is that the experts share their knowledge by writing together a *document* D_S which describes at least one *static state* S of the scenario they want to analyze. For this document only that kind of language $L_{0.i}$ is

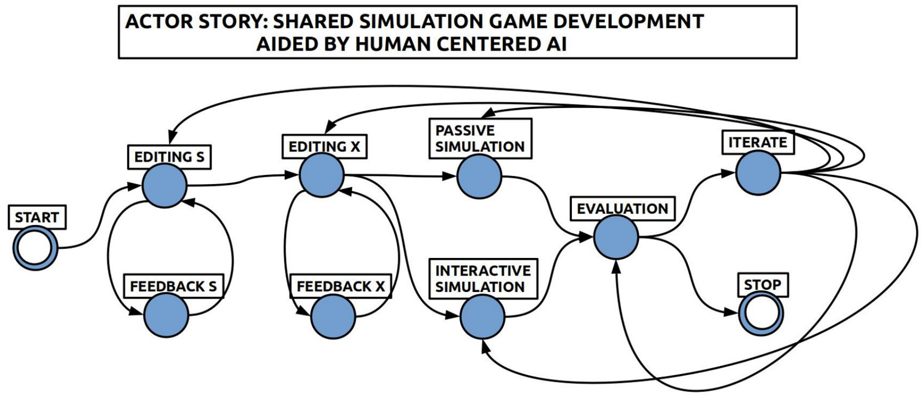

Figure 2: Actor Story for the shared development of simulation games aided by a human centered AI

accepted which has been agreed for the actual phase. Additionally the experts write another document D_X which describes the possible and wanted kinds of *changes* X which can or should happen in the *actual* state S. The editing can be *repeated*. After the editing of D_S, D_X a *feedback of the system* will occur pointing to different kinds of problems together with proposals for improvement.

After the editing and the different feedbacks the system can change to *simulation mode*, either *passively* or *interactively*. In the interactive mode the experts have to *decide* during the simulation how hey would behave in a certain situation and their decisions are taken as input for the simulator. In both modes – passive and interactive – it follows after the simulation an *evaluation* of the results with possible *trace backs* to those situations which caused certain effects.

The actors can stop after the simulation or they can go back to each part of the process described in the actor story.

3 Actor Story Details

Social Settings: The *main goal* of a shared development is the *sharing of experience* in the light of a *selected trigger* Tr. The trigger Tr gives he main theme as well the starting point of a process wherein the contributions of each actor function as *new triggers* assisting the activation of as much as possible knowledge hided in the unconscious state. The social setting of this sharing situation should support therefor a situation where the experts feel comfortable to open their minds and share there experiences. Basically three different kinds of settings are possible:

1. **Single Location [SL]:** The actors are at the same time at the same place and can talk directly. They have one *system interface [SI]* to interact with.

2. **Single Online-Conference [SOC]:** The actors are at the same time at different physical locations but share an online conference where everybody can see and hear everybody and they are sharing one system interface [SI] to interact with.

3. **Distributed Sessions [DS]:** The actors are at different times at different physical locations and are sharing a system interface [SI] which allows the interaction with documents D_S, D_X in a collaborative way: more than one actor can interact with the same document.

By *everyday experience* it looks as if the effect of the social settings is different with regard to the overall goal of sharing of experiences. The most effective setting seems to be the *single location* case, then the *single online conference* case and least the *distributed sessions* case. This suggestions have to be validated in the future by *empirical tests*. In the beginning of this project we will only use the single location as well as the single online conference case.

It has to be remarked that we are not discussing here the future extensions where there are many simulation models stored online and are available online such that actors can use them at any time from every place.

From start to Stop: In the lower part of figure 3 the general setting for the interactions between actors and the system interface [SI] is shown. Whether the actors are meeting at the same physical location or in an online conference will not be distinguished because it is assumed that in both situations there is only one interactive system interface [SI] to interact with.The system interface mediates the interactions between the actors and the simulator. Depending from the actual task there can be more than one window visible on the screen of the interface.[2] The simulator can include different grades of artificial intelligence [AI].

Interactive Simulation: The interactive simulation has special additional requirements.

The only case where the overall application setting differs a little bit is the case of an interactive simulation (cf. figure 4). In this case it is necessary that the group of actors organize themselves in different subgroups according to the *role* they want to play in the simulation. While we keep the principle of one group – physically or online – we have to assume that the sub-groups organize

[2] For the future it is assumed that all inputs and outputs using text in the base version can be paralleled by voice input and output.

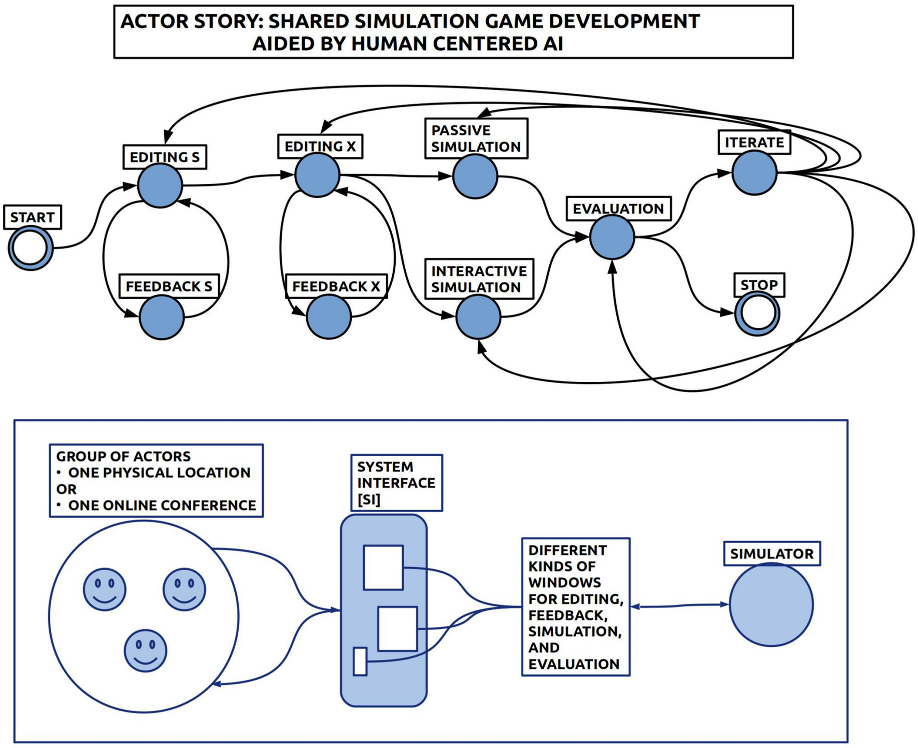

Figure 3: Actors and system interface (SI) for all states

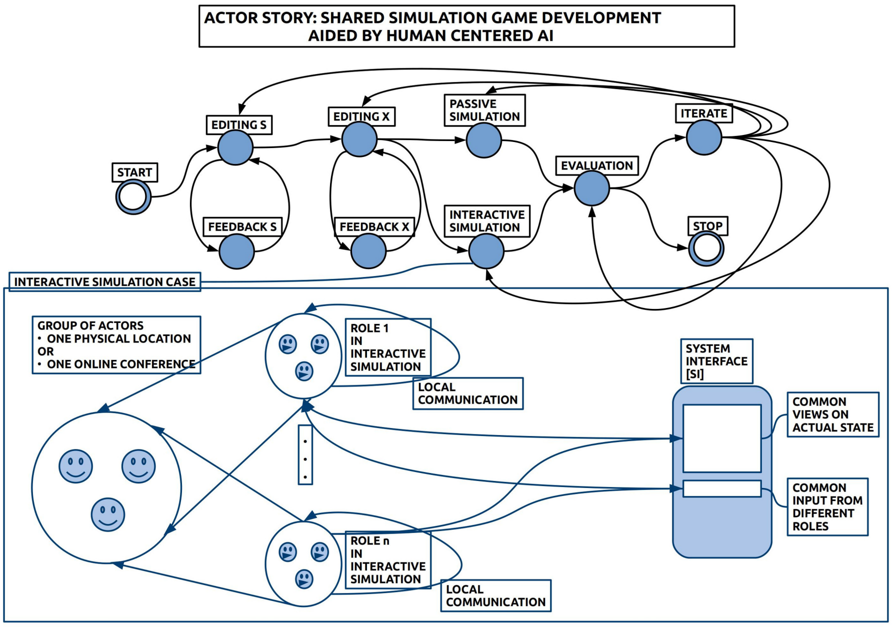

Figure 4: Application settings in case of an interactive simulation

a *local communication* restricted to the sub-group. During the simulation the one system interface shows on demand common views of the actual state and a common interface for input messages, where the different roles identify themselves to the system by some agreed name. In this setting all inputs and outputs to the system are *public*.[3]

If the interactive simulation case switches to the evaluation phase then it is important that all actors are together and all views are in common.

[3] In a future version it will be possible that each role has its own *non-public* input for those inputs, which they want to *hide* from the other roles.