Summary R&D Plan for April-July 2009
Novamente LLC

Ben Goertzel, Cassio Pennachin
April 10, 2009

This brief document summarizes Novamente LLC's software R&D plans for April-July 2009. (It does not touch on any of Novamente's nor Biomind's consulting work; nor any of Ben's theoretical "math of AI" work.)

The focus for this time period will be getting PLN (probabilistic logic), RelEx (language comprehension), NLGen (language generation) and virtual agent control (in the RealXTend virtual world) to work together within the OpenCogPrime (OCP) system (built within the OpenCog framework). As a main (but not exclusive) goal we will be seeking to demonstrate some examples of the use of embodied experience to help with natural language disambiguation (e.g. parse selection and anaphor resolution).

At the end of this period we hope to have virtually embodied agents that can comprehend (using RelEx) and produce (using NLGen) simple English related to the objects and events in their virtual environment, and carry out some examples of simple (PLN-based) reasoning based on what they experience and what they intake via language.

We are not aiming for any "human level AI" scale research breakthroughs during this period, but rather for the integration and further maturation of existing code and algorithms, with a view toward making an integrated platform within which dramatic breakthroughs can later occur (after some further work is done). Nevertheless, this work *will* be breaking exciting new ground, because no one has gotten inference, language and embodiment all working together before, even to the limited extent we're seeking to do over this time period.

Team Members

Name	Focus	Location	Time Allocation
Ben Goertzel	Overall coordination; PLN inference; language generation	USA	Full time
Cassio Pennachin	Overall coordination and software architecture	Brazil	1/3 time
Joel Pitt	Integration of PLN and NLP	New Zealand	2/3 time
Nil Geisweiller	PLN inference	Bulgaria	Full time
Carlos Lopes	Integration of NL generation with OpenCogPrime	Brazil	Full Time
Welter Silva	Completion of integration of OpenCogPrime with RealXTend virtual world; OpenCog framework improvements	Brazil	Full Time
Samir Araujo	Integration of NL comprehension	Brazil	Full Time

	(RelEx) with OpenCogPrime		
Murilo Queiroz	Experimenting with use of virtual embodiment for NL disambiguation	Brazil	Half Time
Ruiting Lian	NLP: language generation	China	Half time

Work Breakdown

Here we describe this work in slightly more detail.

Integration of NLP and OpenCogPrime software tools

We currently have software for NL comprehension (RelEx) and generation (NLGen), but it has not been integrated with our OpenCog system for artificial cognition, reasoning, learning, etc. It is time to finally perform this integration.

Carlos will complete the integration of RelEx (including the RelEx2Frame component) with OpenCog, and then carry out various RelEx improvements needed to make RelEx useful to virtually embodied agents.

Samir will integrate the NLGen language generation framework with OpenCog, and carry out various NLGen extensions and improvements needed to make NLGen useful to virtually embodied agents.

NL Generation Improvements

Ruiting will continue her work on natural language generation, as our NL generation framework is not yet as mature as our NL comprehension framework. Her work is linguistic in focus and can proceed in parallel, largely independently of Samir's work integrating NL generation with OCP.

Initial integration of NLP and PLN

Joel will focus on using PLN to do inference on the output of RelEx's natural language comprehension functionality. (He will be aided off and on in this by Linas Vepstas, a Novamente employee who is using RelEx in a customer project, and may be using PLN as well in this context.)

Murilo will focus specifically on uses of the system's virtually embodied experience to help with natural language disambiguation

Further implementation, testing and tuning of PLN

Joel will make various improvements and extensions to the PLN framework as needed in the course of getting language-based inference to work adequately.

A number of PLN inference rules and formulas still need to be coded, for instance the ones handling spatial, temporal and intensional inference. Nil will code and test these, guided by the mathematics in the "Probabilistic Logic Networks" book and the

"Real World Reasoning" (RWR) manuscript. As well as being helpful for our overall software project, this work will enable the completion of the examples in the RWR manuscript, which is expected by the publisher mid-summer.

Virtual world integration improvements

Currently the OCP system is integrated with the proprietary Multiverse virtual world platform, and partially integrated with the open-source RealXTend (Rex) virtual world platform. There are problems with both integrations but we feel the Rex integration is a better path forward because the open-source nature and relative simplicit of Rex allows problems to be more straightforwardly resolved. So, Welter will focus initially on completing the integration of OCP with Rex.