



An Overview of SILVIA a System for Conversational Artificial Intelligence

March 2, 2009

Introductions

- Leslie Spring, Founder and CTO
 - **Background**
 - *Electronic Arts*
 - *Disney*
 - *Sony*
 - *3D Gaming Engines and Tools*
 - *Architectures for Web Content Sharing/Delivery*
 - **SILVIA and Cognitive Code**

Introduction to SILVIA

▪ SILVIA stands for:

- **S**ymbolically
- **I**solated
- **L**inguistically
- **V**ariable
- **I**ntelligence
- **A**lgorithms



Introduction to SILVIA

- **S**ymbolically **I**solated:
 - The core of the SILVIA A.I. does not operate on words or sentences.
 - SILVIA's core operates on pure numeric representations of concepts and their mathematical relationships to one another.
 - Because of this "symbolic isolation", the A.I. core can ignore human language constraints, giving SILVIA more flexibility to think and respond in "concept space".

Introduction to SILVIA

- **Linguistically Variable:**
 - SILVIA uses unique algorithms to extract concepts from human language input, allowing users to speak or type input in their own way, yet still have their thoughts understood by the AI.
 - SILVIA's response construction and wording are dynamic, so that depending on various factors, concepts can be expressed by the AI in multiple grammatically correct ways.
 - The SILVIA technology is language independent and multi-lingual, working with any one or more human languages in which it is trained.

What is the SILVIA technology?

SILVIA is a runtime engine, SDK, and integrated development environment (IDE) that enables developers to create intelligent applications that can carry on complex conversations with people using robust, flexible, natural language. The SILVIA platform includes:

- A platform-independent runtime for deployment of SILVIA applications and content across multiple hardware and OS configurations
- A unique framework for building intelligent, conversational behaviors and applications
- An exposed API for programmers to create new functionality, and to leverage the SILVIA core algorithms
- Embedded scripting and associated editing/debugging tools

What does SILVIA do?

- **SILVIA-enabled** intelligent applications can:
 - Take in human input whether through speech, written text, or other input methods
 - Understand the context of the input
 - Execute a set of commands based on the input and the context
 - Interact with an operating system or application where an API or web service has been provided
 - Interact directly with file systems, networked systems, web content, and more
 - Operate as a client application, a server application, a node in a peer-to-peer network, or freely change states dynamically according to application needs

What can SILVIA be used for?



▪ Smart Toys



▪ Automotive Telematics



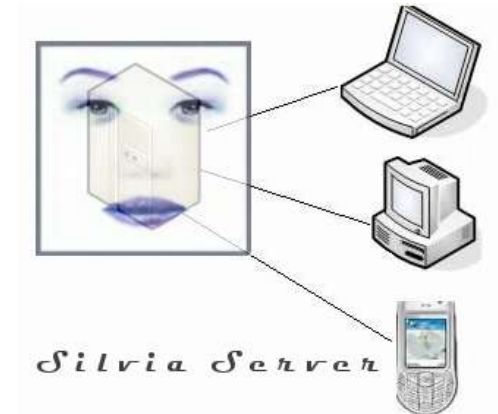
▪ Mobile Devices



▪ Video Games



▪ Avatars and Personal Assistants



▪ Integrated Solutions

SILVIA is highly modular and scalable

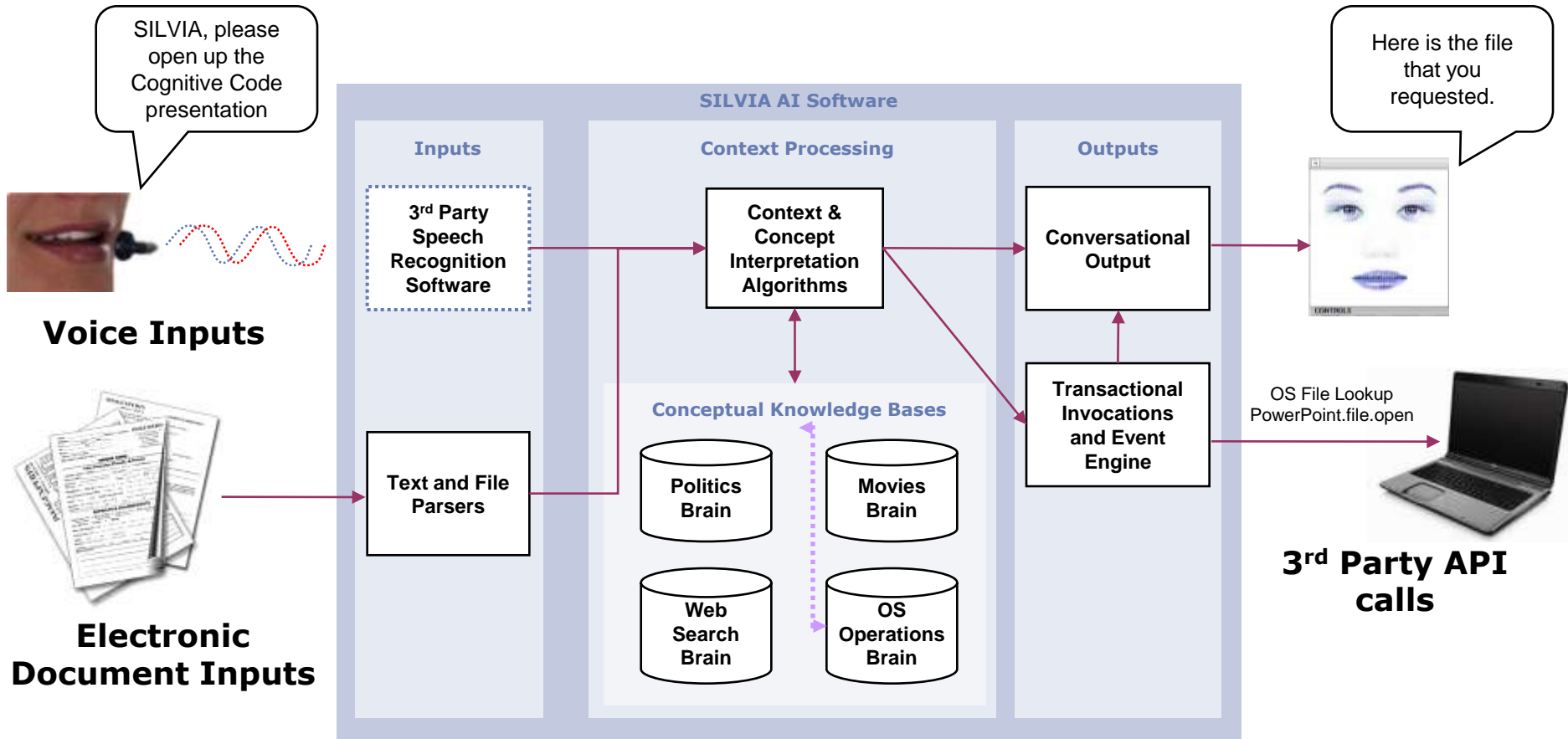
- You can create different **personalities or characters**
 - Vocabularies, and instructions for how to respond stored in different "BRAIN" files
 - SILVIA can load multiple BRAIN files and swap between them

- You can swap in different **skins** and **voices**
 - Import any 2D or 3D character or avatar graphics
 - Load different voice fonts
 - Operate with dialog recordings (similar to IVR systems)

- You can dynamically **increase its knowledge blocks**
 - Create new BRAINS for math, reading, movies, books politics
 - Have SILVIA log on and download new BRAINS
 - Now it "knows kung fu!"

How does SILVIA work?

SILVIA parses speech or text inputs into mathematical concept symbols, and then uses modular AI Brain files to execute contextual system commands



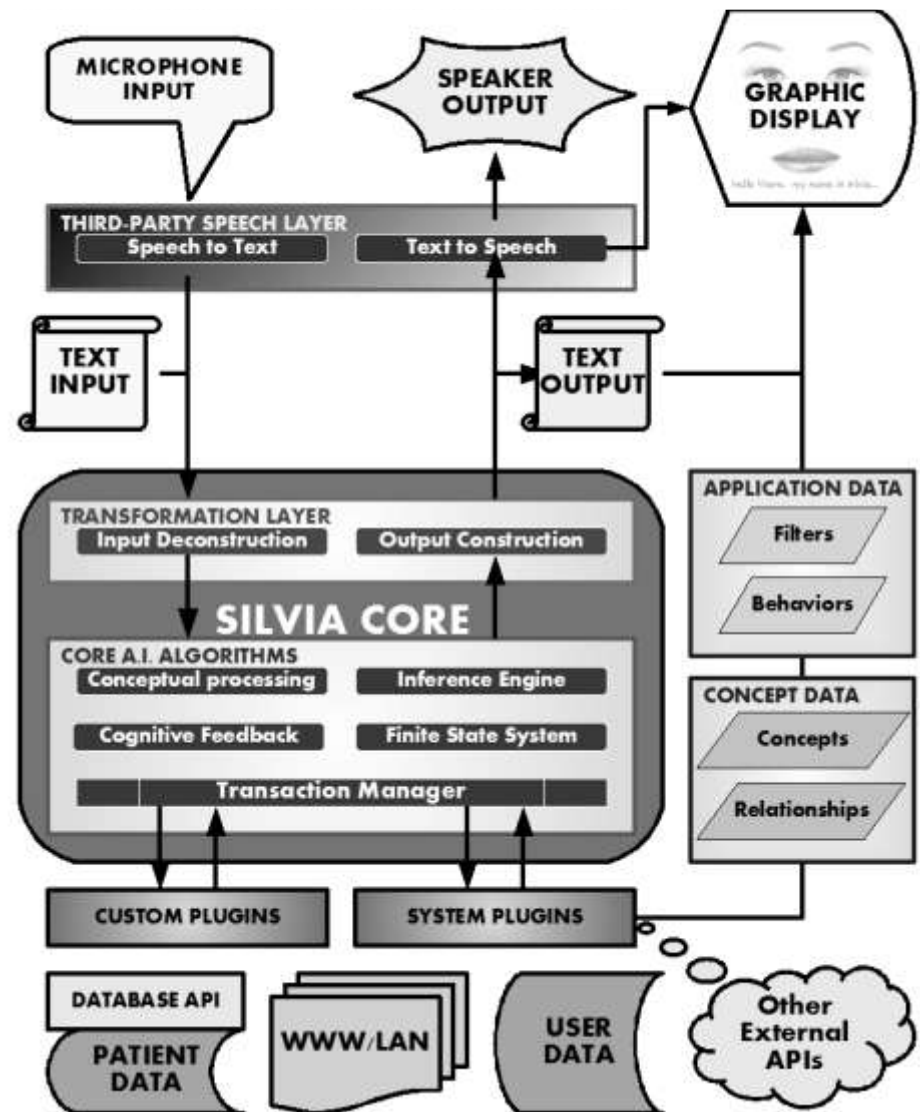
What platforms can SILVIA run on?

- SILVIA is **operating system and platform independent**.
 - SILVIA can run on WinXP, Vista, Windows Mobile, Apple OS-X, Linux, BSD, Solaris, Palm OS, and virtually every other system
 - SILVIA can run on a server, desktop, laptop, or hand-held processor
- SILVIA code is lightweight and can be loaded on **ARM processors and chipsets**
 - The Core SILVIA AI footprint runs under **5 MB**



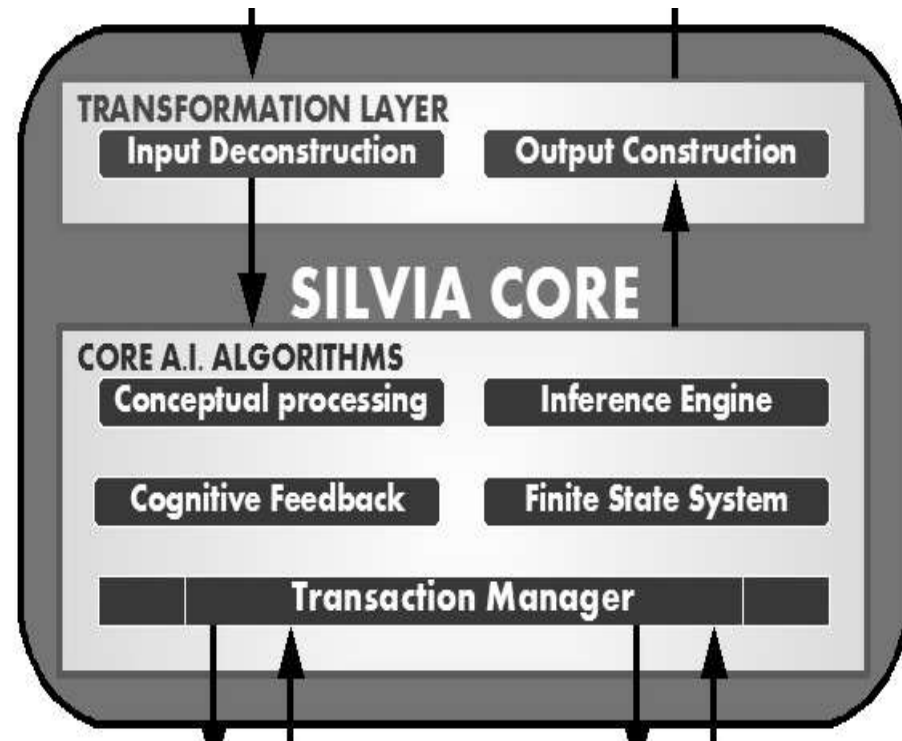
Sample Application Architecture

- SILVIA CORE
- Enabling Technologies
- SILVIA CORE Data
 - Filters
 - Behaviors
 - Concepts
- Plugins
- External Interfaces
- User Data



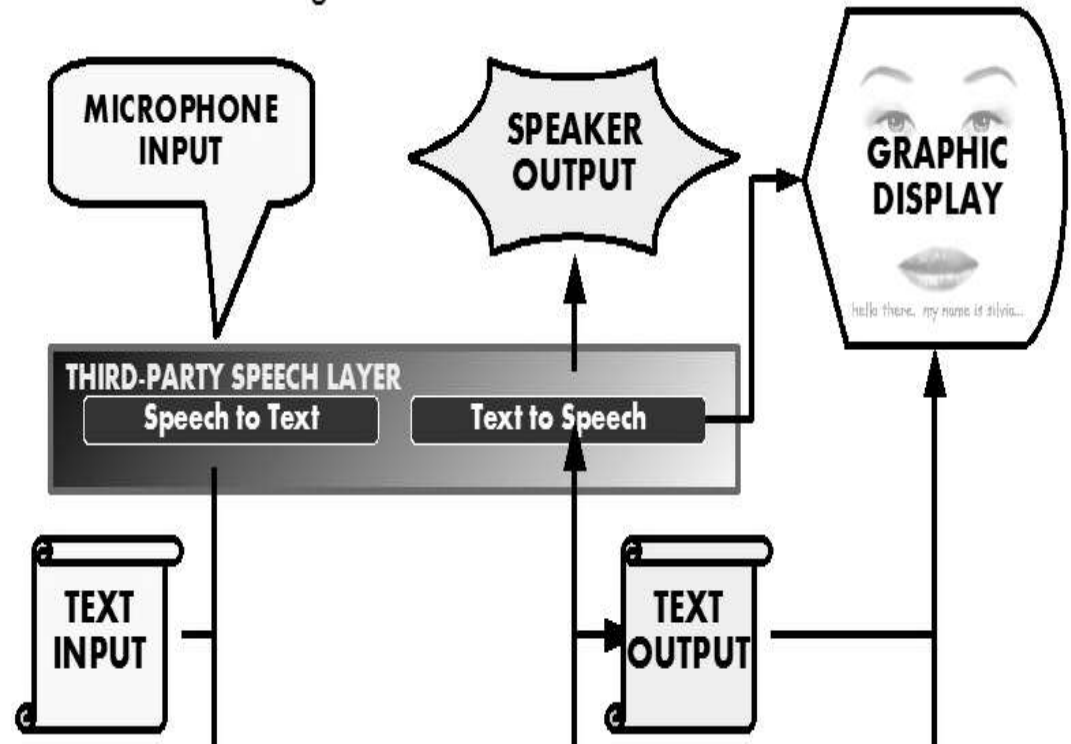
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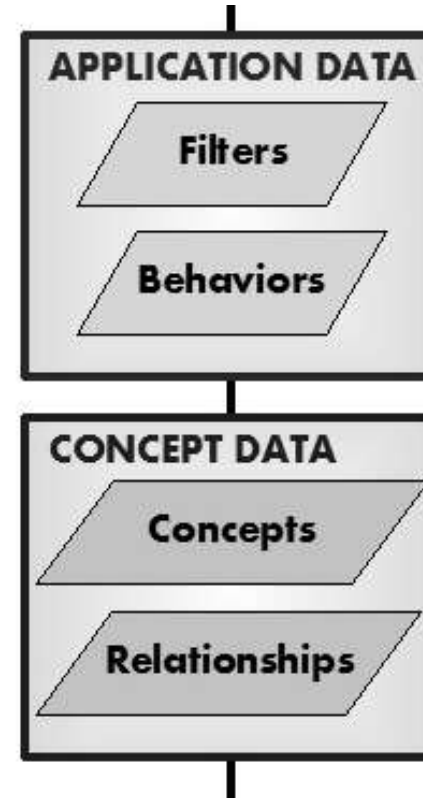
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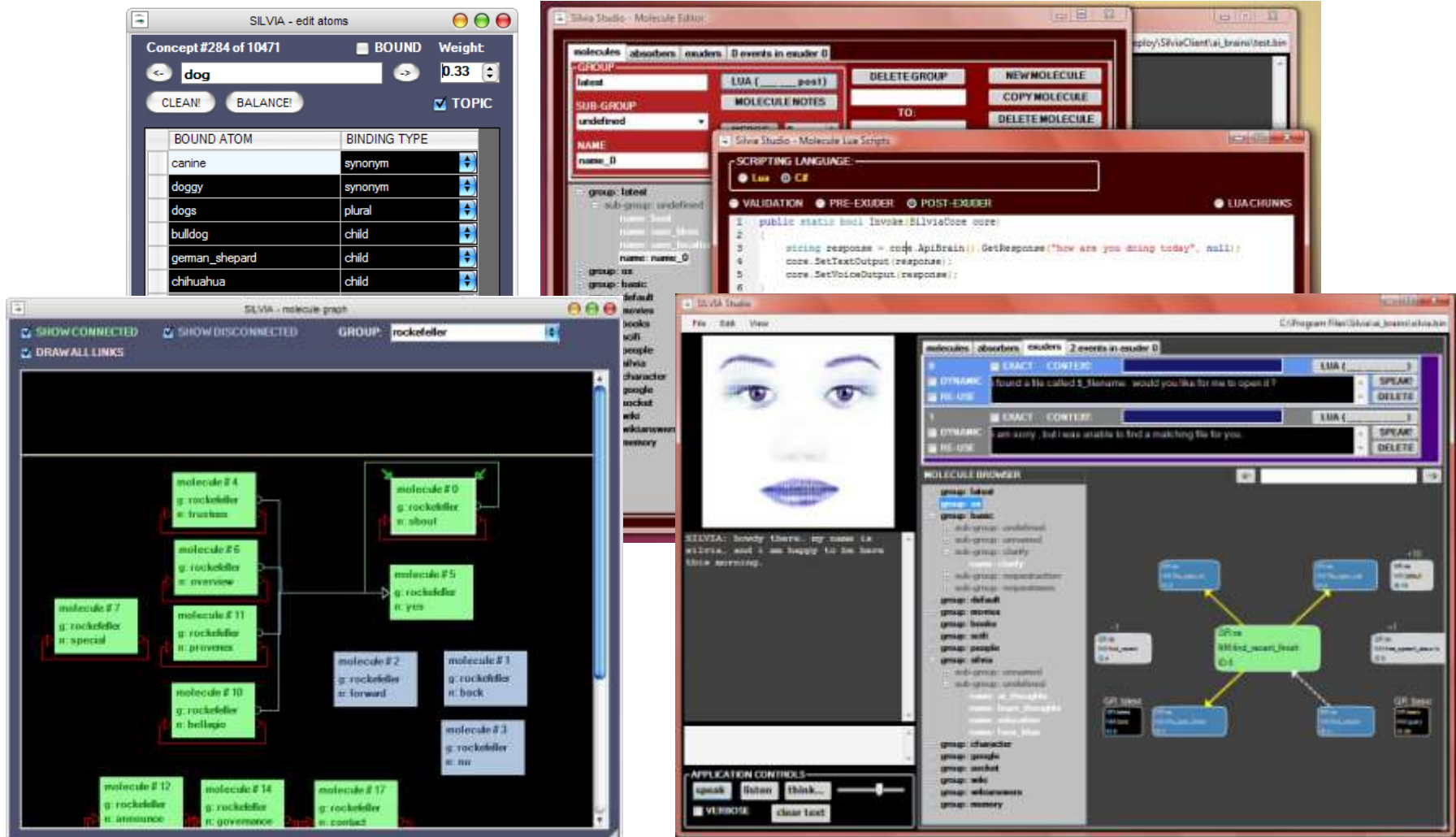


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Content Management for Application Data



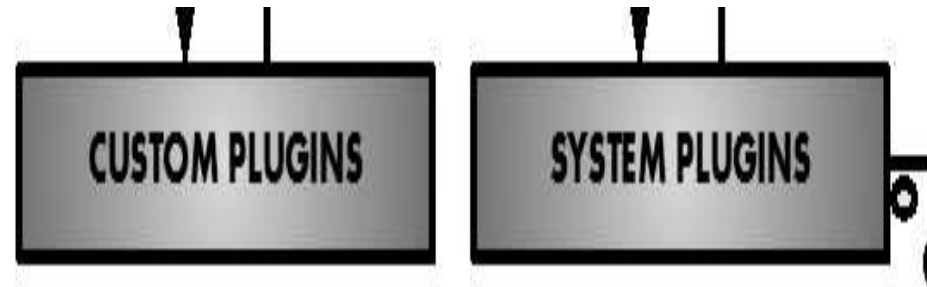
The image displays several screenshots of the SILVIA application interface:

- SILVIA - edit atoms:** Shows a search for the concept "dog" with a weight of 0.33. A table lists bound atoms and their binding types:

BOUND ATOM	BINDING TYPE
canine	synonym
doggy	synonym
dogs	plural
bulldog	child
german_shepard	child
chihuahua	child
- Silvia Studio - Molecule Editor:** Shows a Lua script for molecule management with buttons for "DELETE GROUP", "NEW MOLECULE", "COPY MOLECULE", and "DELETE MOLECULE".
- SILVIA - molecule graph:** A hierarchical graph showing molecule groups like "rockefeller" and "brillagio" with associated molecule IDs and names.
- SILVIA Studio (Chat):** A chat window showing a user's face and the text: "SILVIA: honey, there's my name in there, and I am happy to be here this morning." Below the chat are application controls: "speak", "listen", "think...", "VIBROHE", and "clear text".
- SILVIA Studio (Molecule Browser):** A detailed view of molecule groups and their relationships, including a "MOLECULE BROWSER" and "APPLICATION CONTROLS".

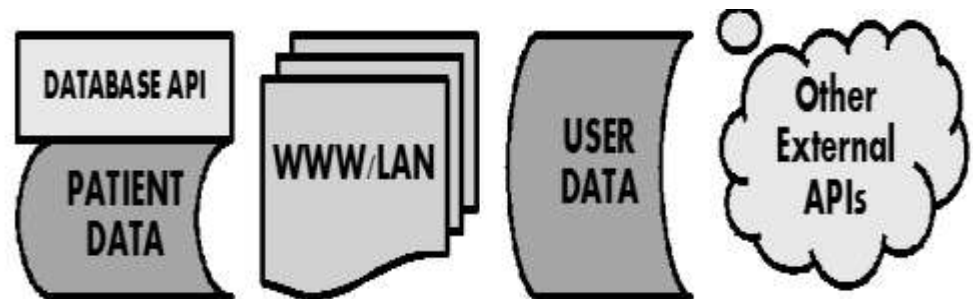
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Q&A

silvia

Silvia Client

Meet SILVIA:

Likes: chatting about artificial intelligence, science fiction movies, and learning to do helpful things for people.

Lives in: i am somewhere in cyberspace, enjoying our conversation.

Transcript:

SILVIA: what's up there.
my name is silvia, and i
am pleased to be here this
afternoon.

Text Entry:



www.cognitivecode.com