

# A Cognitive Architectural Map of AI Startup Ideas

Bo Morgan

*bo.morgan@bomorgan.io*

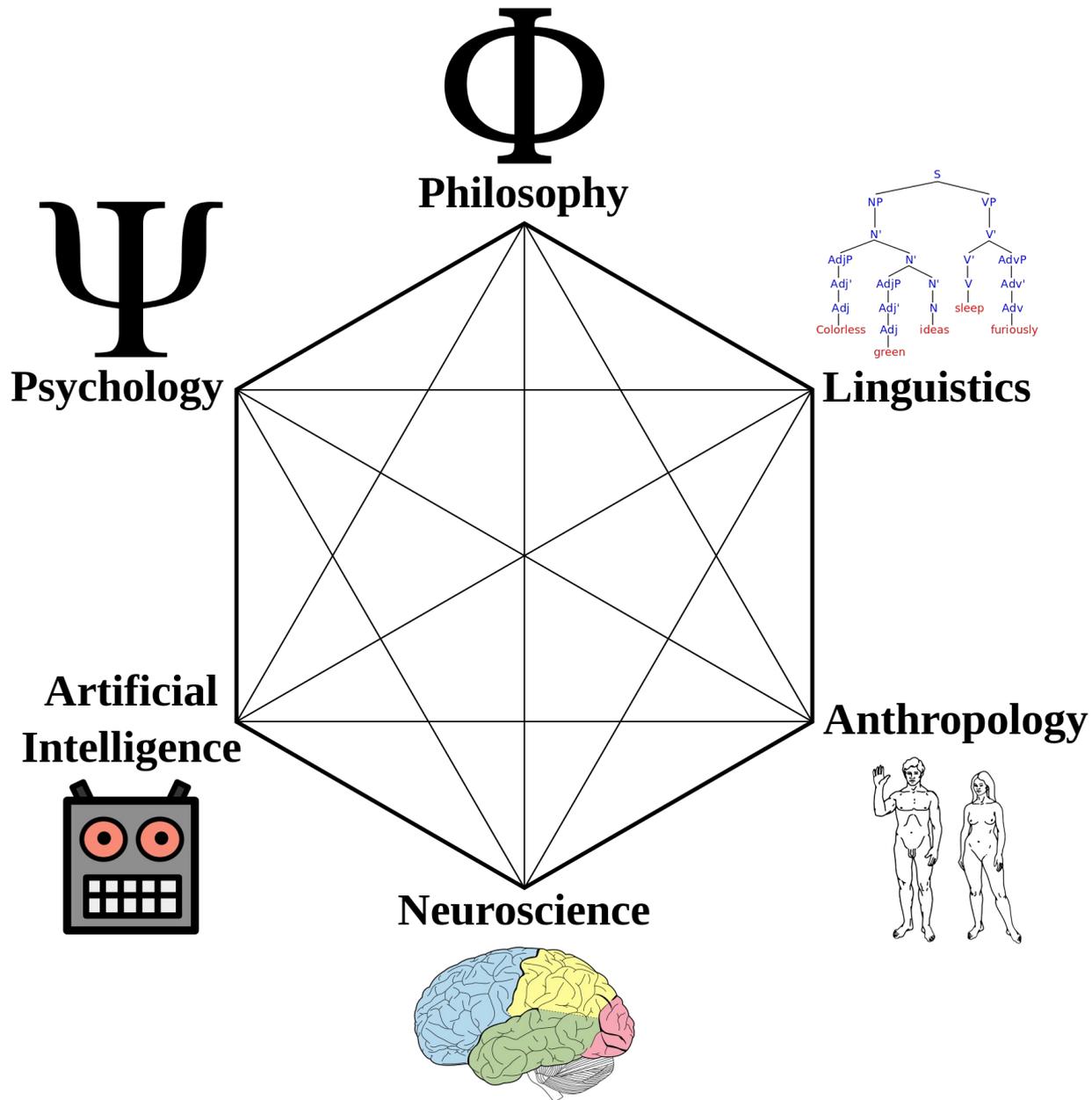
Technology Lead, DreamWorks Animation (Current)  
Chief Technology Officer, AiBrain (Past)  
PhD, MIT Media Lab (Education)

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# Talk Main Points

- Suddenly a lot of data has made old algorithms that require a lot of data very useful and a few breakthroughs have been made.
- “**One-Shot**” and “**Impasse Resolution**” algorithms, such as analogical reasoning, are still needed!
- Architectures are being developed, such as Alpha Go, that include 4+ layers of 6-layered Emotion Machine, **Self-Reflective** and **Self-Conscious** are next!
- **Social Emotional Learning (SEL)** may be theoretically rich area of cognitive sciences for the next AI breakthroughs!

# Cognitive Sciences



# Emotion Machine Cognitive Architecture

6) Self-Conscious Thinking

Ways to Think: Guilt, Pride, Esteem  
Objects: Imprimers, Cultural Taboos

5) Self-Reflective Thinking

Ways to Think: Self Identifying, Socially Relating  
Objects: Identities, Self-Concepts, Social Groups

4) Reflective Thinking

Ways to Think: Focused, Brainstorming, Learning  
Objects: Goals, Plans, Failure, Success

3) Deliberative Thinking

Ways to Think: Planning, Getting Stuck, Analogizing  
Objects: Physical Objects

2) Learned-Reactive Thinking

Ways to Think: Executing, Controlling, Failing  
Objects: Scripts, Conditional Plans

1) Built-In Reactive Thinking

Ways to Think: Perceive, React  
Objects: Sensory Percepts, Motor Actions

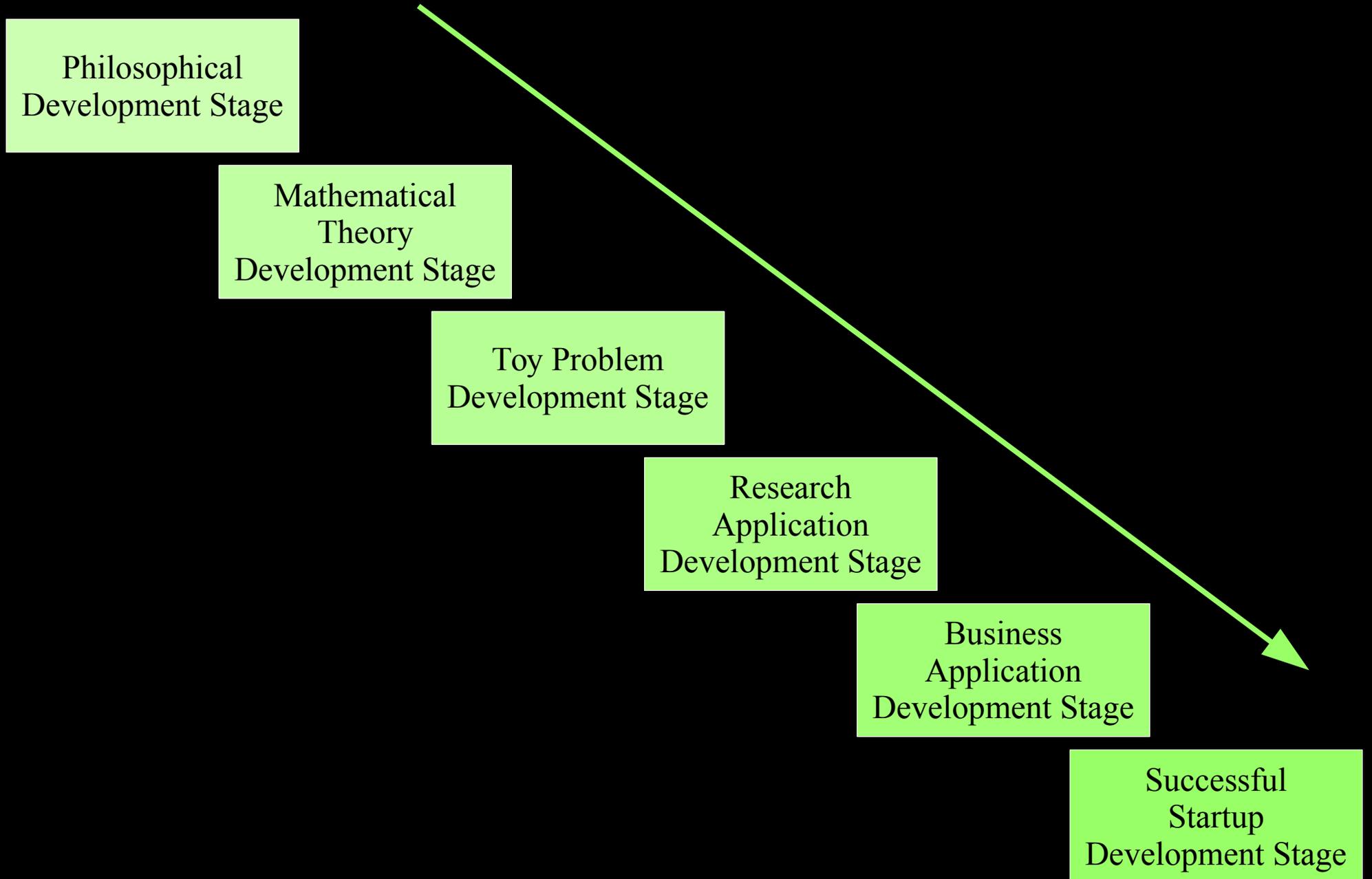
# Cognitive Scientific Roles and AI Startup Idea Types

						<i>Artificial Intelligence</i> (Architectures)	<i>AI Startup Idea Types</i>
					<i>Computer Science</i> (Programs)	Layers of Learning, Planning, and Execution	Learning Control
				<i>Philosophy</i> (Logic & Reasoning)	Computational Logic & Reasoning Programs	Causal Learning & Reasoning Algorithms	Semantic Reasoning
			<i>Linguistics</i> (Language & Semantics)	Natural Language Semantic Theories	Computational Language & Semantic Programs	Cognitive Conversational Agent	Conversational Agent
		<i>Psychology</i> (Behavior & Cognition)	Story Generation & Understanding	Learning and Reasoning with Causal Models	Computational Behavior Programs	Emotion Machine, CogAff, & Act-R	Behavior Assistant
	<i>Neuroscience</i> (Brains & Neurons)	Fixed Action Patterns, Reinforcement Learning	Speech Synthesis & Understanding	Knowledge versus Meta-Knowledge Distinction	Computational Neuron Programs (Artificial Neural Networks)	Vertical Control & Horizontal Communication	Perception & Motor Control
<i>Anthropology</i> (Evolution)	Evolution of The Brain	Evolution of Cognition	Evolution of Communication	Evolution of Logic & Reasoning	Computational Evolution Programs	Evolution of Mental Process Technology	Assisting Environment

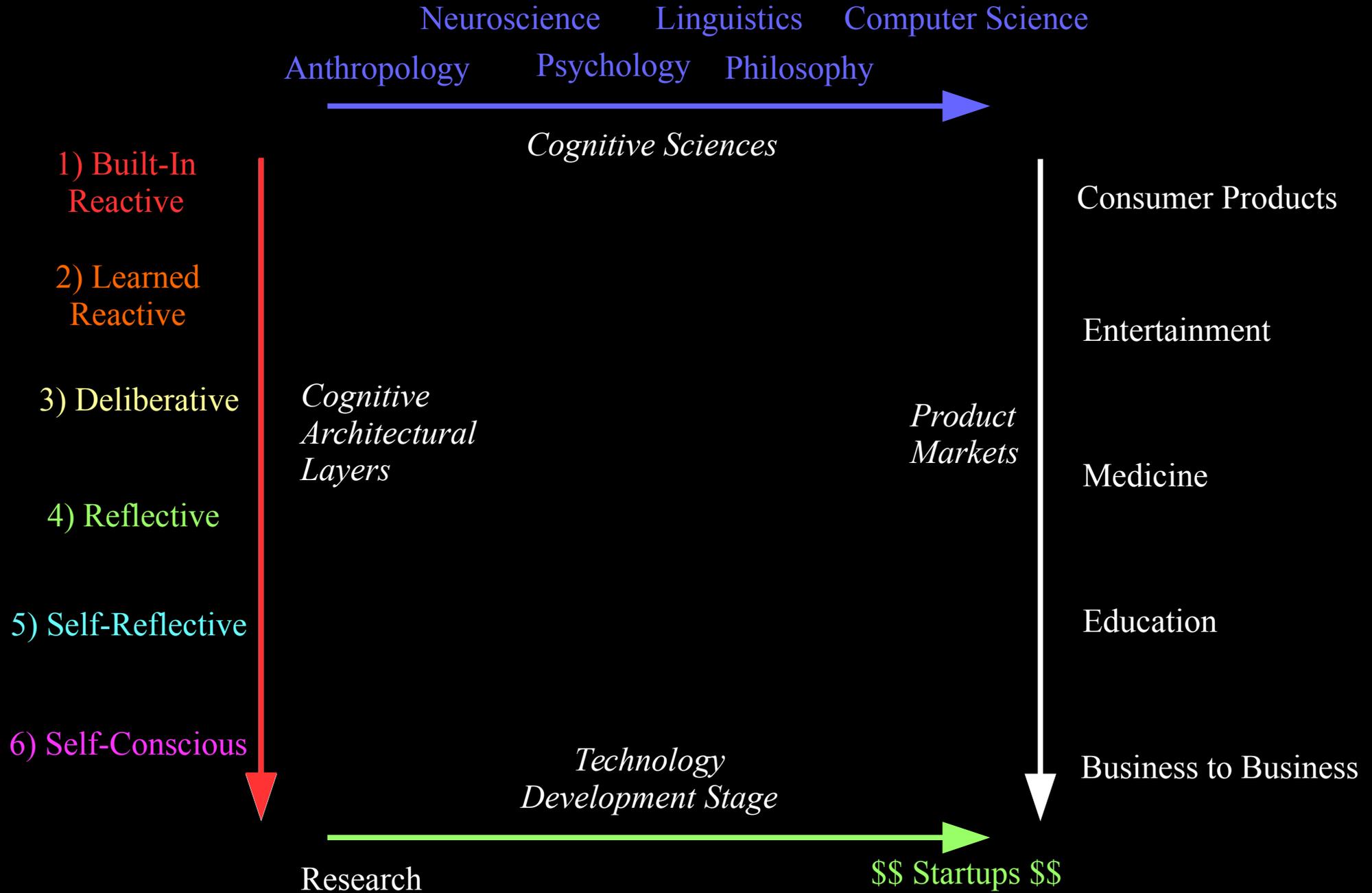
# Market Segment AI Startup Idea Types

<i>AI Startup Idea Types</i>	<i>Cloud Services</i>	<i>Education</i>	<i>Medicine</i>	<i>Entertainment</i>	<i>Consumer Products</i>
Learning Control	General Learning Control Services	Physical Education, Sensory-Motor Coordination	Sensory-Motor Disorders	Preference Learning User-Model Learning	Activity Recognition Life Monitor Wearable
Social and Emotional Learning	General Semantic Reasoning Services	Story Understanding, Story Writing	Social and Emotional Training and Rehabilitation	Adaptive Storytelling	Artificial Companions
Conversational Agent	General Conversational Agent Services	Conversational Study Assistant	Conversational Health Assistant	Conversational Entertainment Guide	Conversational Assistants
Behavior Assistant	General Behavior Assistant Services	Cognitive Trainer, Social Trainer, Emotional Trainer	Cognitive Rehabilitator, Social Rehabilitator, Emotional Rehabilitator	Life Goal Oriented Entertainment	Goal-Oriented Planning and Scheduling Assistant
Perception & Motor Control	General Perception & Motor Control Services	Perception & Motor Control Training, Toy Robots	Perception & Motor Control Rehabilitator, Sensory Prosthetics, Prosthetic Limbs	Games, Animated Movies, Virtual Realities, Animatronics	Augmented Intelligence, Wearables
Assisting Environment	General Assisting Environment Services	Educational Problem Solving Environment	Smart Hospitals, Smart Ambulances, Smart Search & Rescue	Environment Learning & Control, Augmented Realities	Activity Recognition, Smart Home, Smart Kitchen

# Technology Development Stage



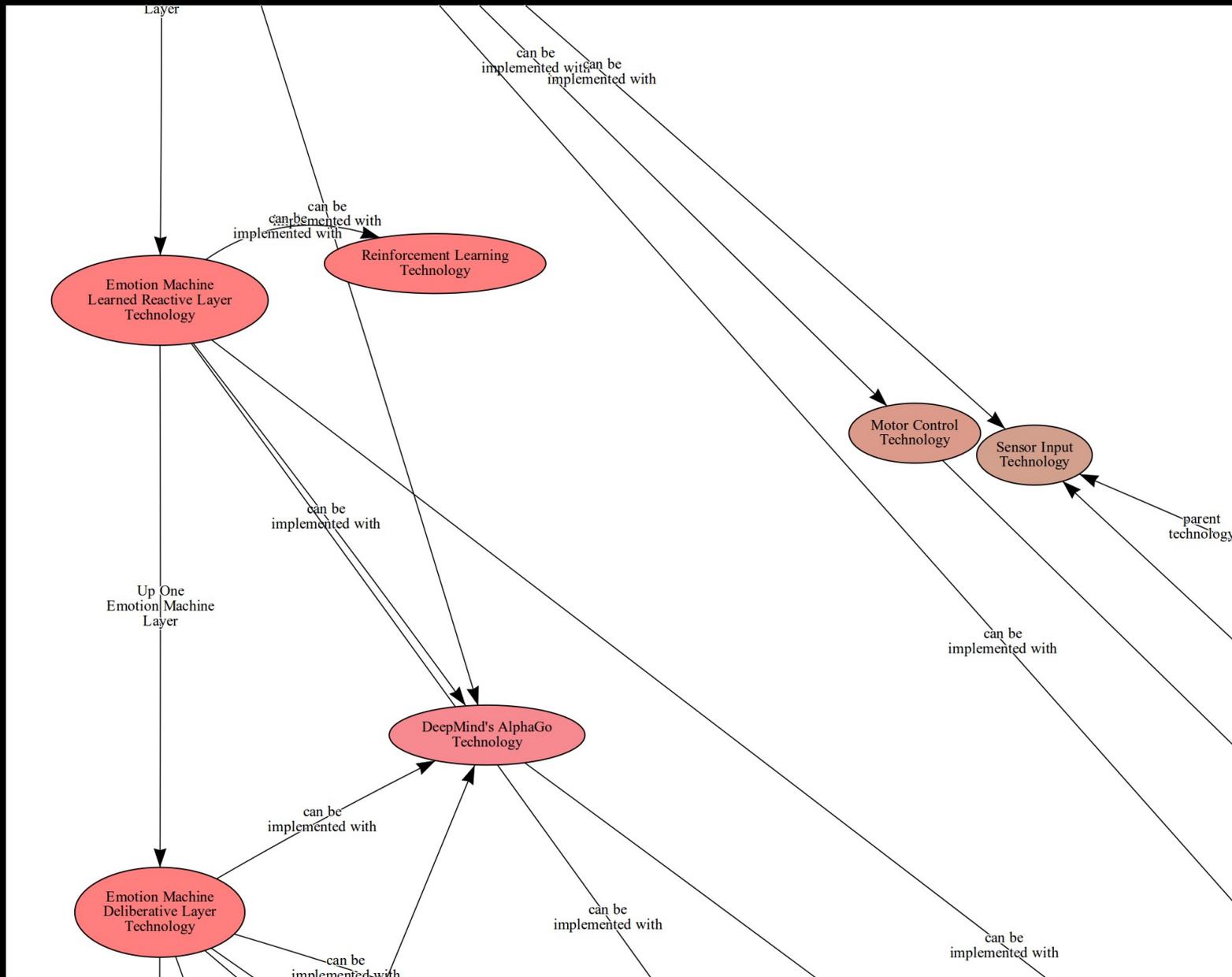
# Cognitive Architectural Map of AI Startups





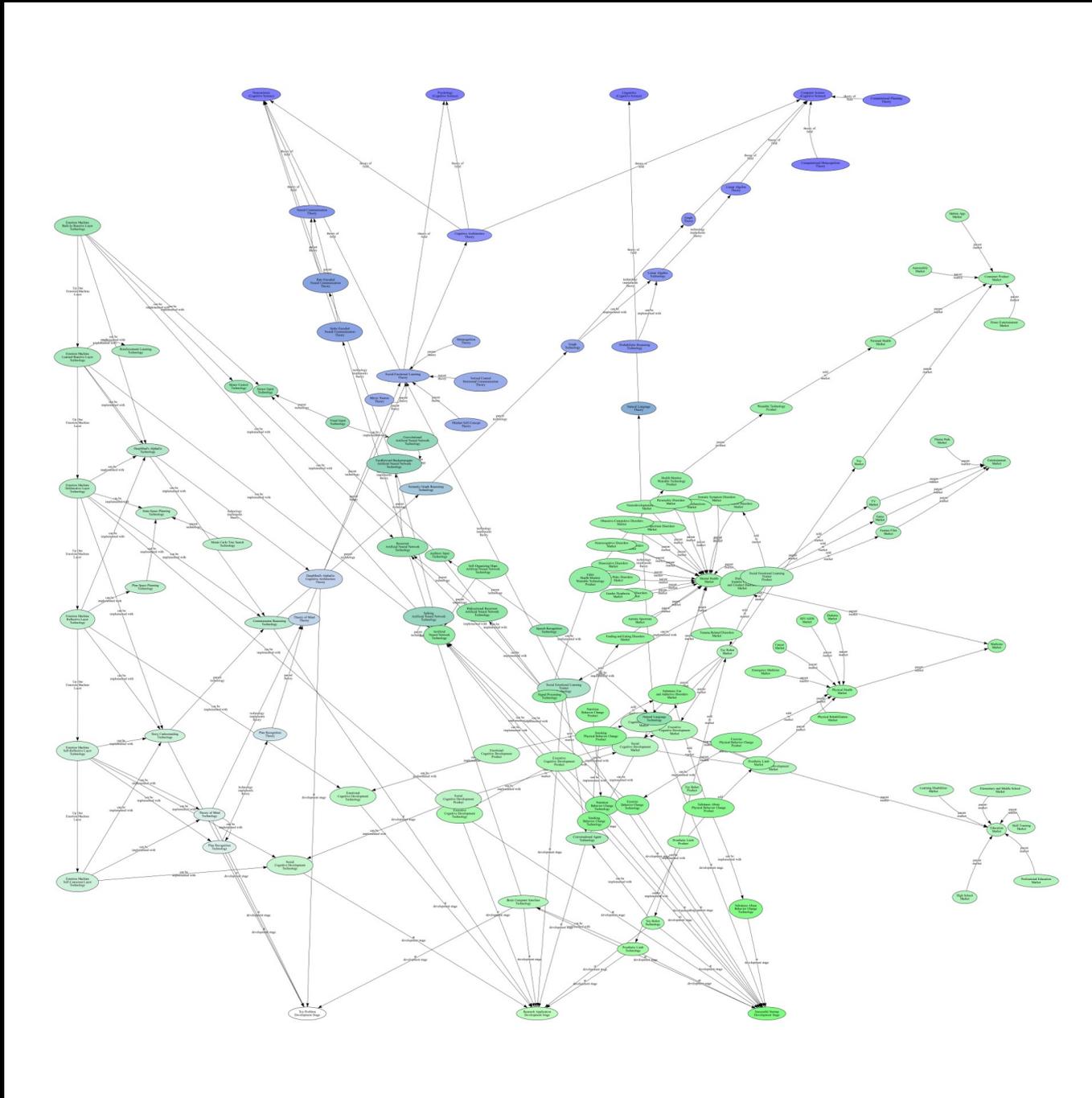


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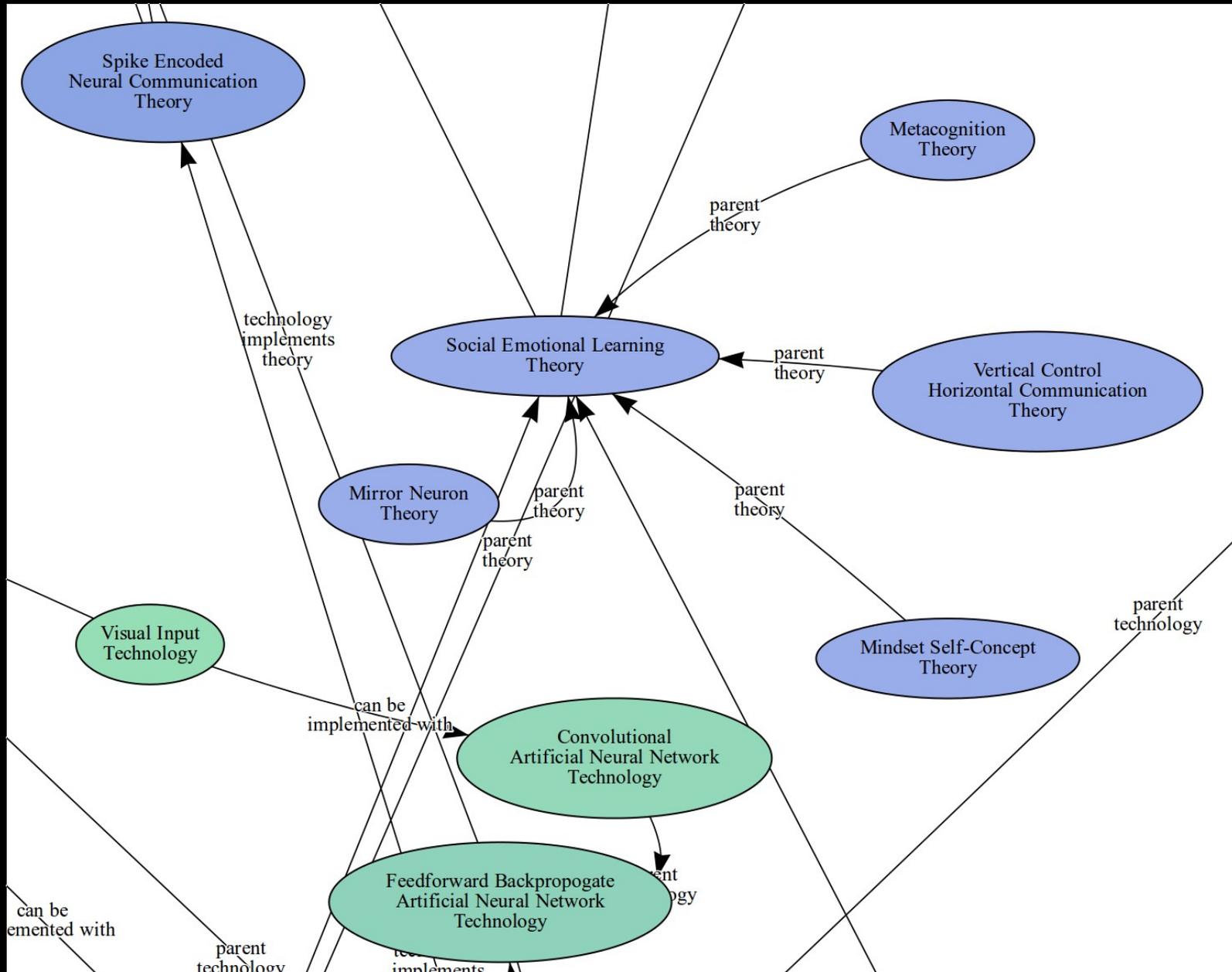
Deliberative and Reflective Cognitive Architectural Related Technologies

# Cognitive Architectural Map of AI Startups





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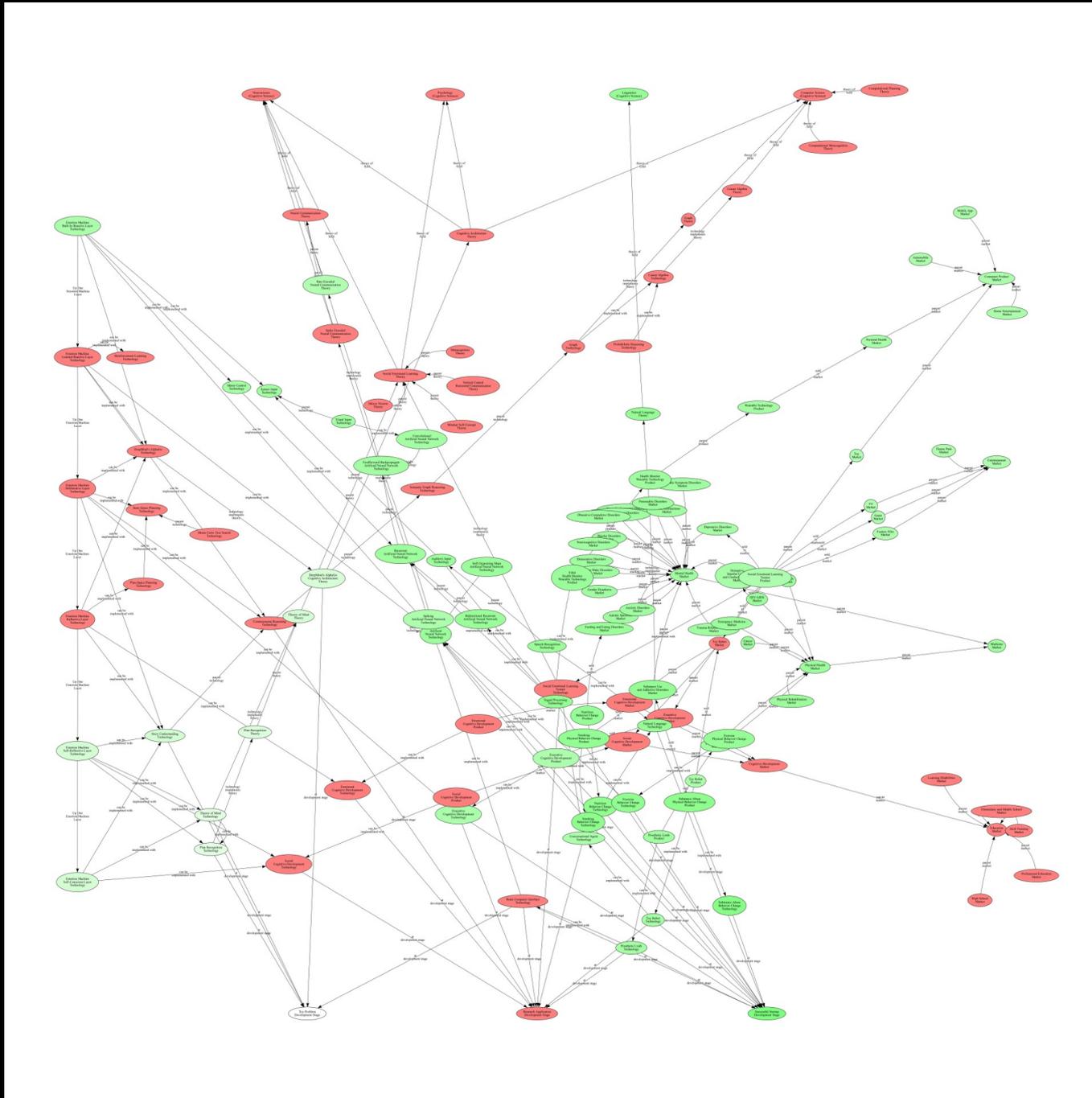
Intersection of Neuroscience and Psychology with AI Technology





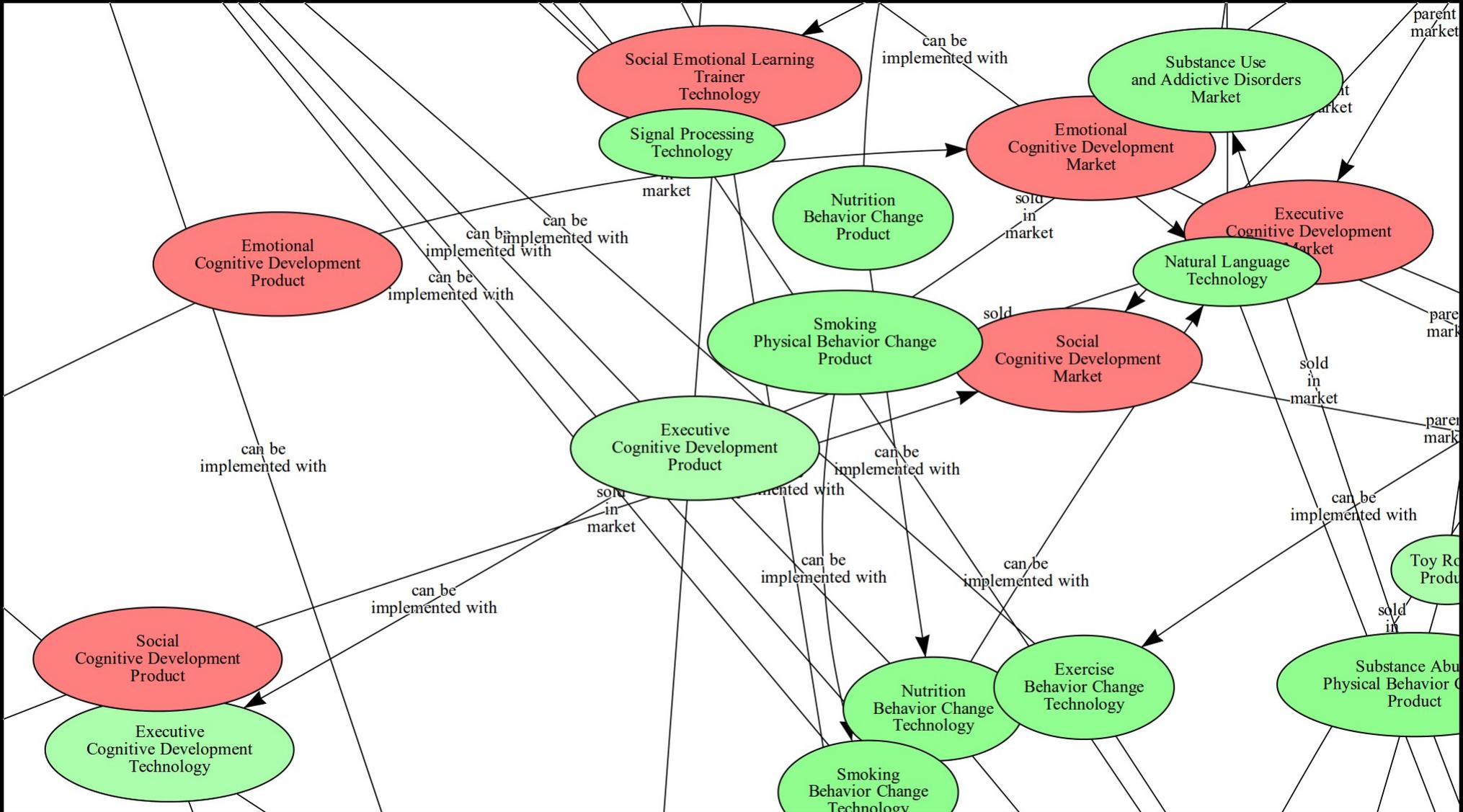


# Cognitive Architectural Map of AI Startups





# Cognitive Architectural Map of AI Startups



An Area with Mixed Up-and-Coming Technologies and Already Successful Startups

# Summary

- Suddenly a lot of data has made old algorithms that require a lot of data very useful.
- “**One-Shot**” and “**Impasse Resolution**” algorithms, such as analogical reasoning, will be needed!
- Architectures are being developed, such as Alpha Go, that include 4+ layers of 6-layered Emotion Machine, **Self-Reflective** and **Self-Conscious** are next!
- **Social Emotional Learning (SEL)** may be theoretically rich area of cognitive sciences for the next AI breakthroughs!
- Also, you can interact with the map used in this presentation at <http://bomorgan.io/>