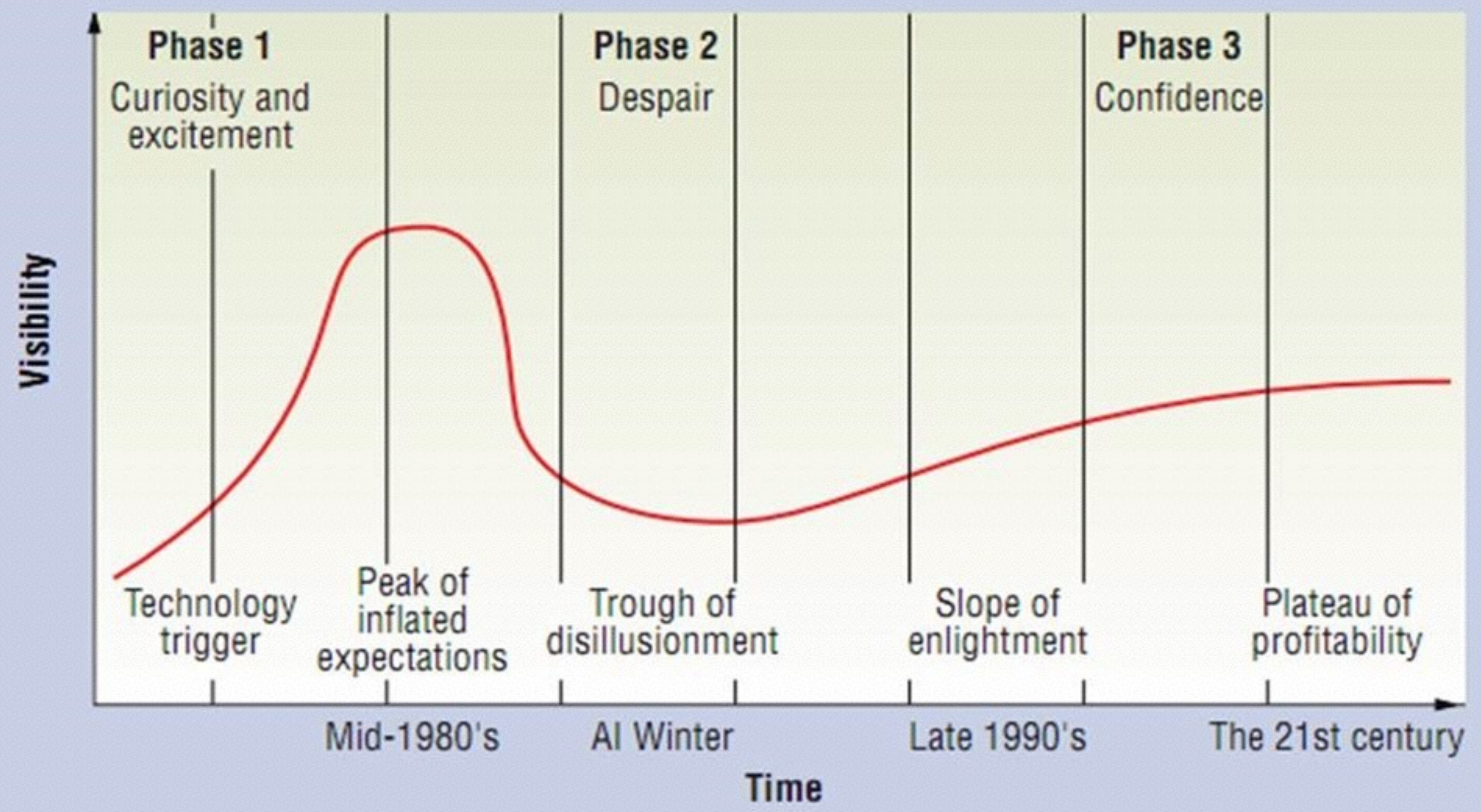


人工智能：趋势 机会和思考

2016.12.16北京

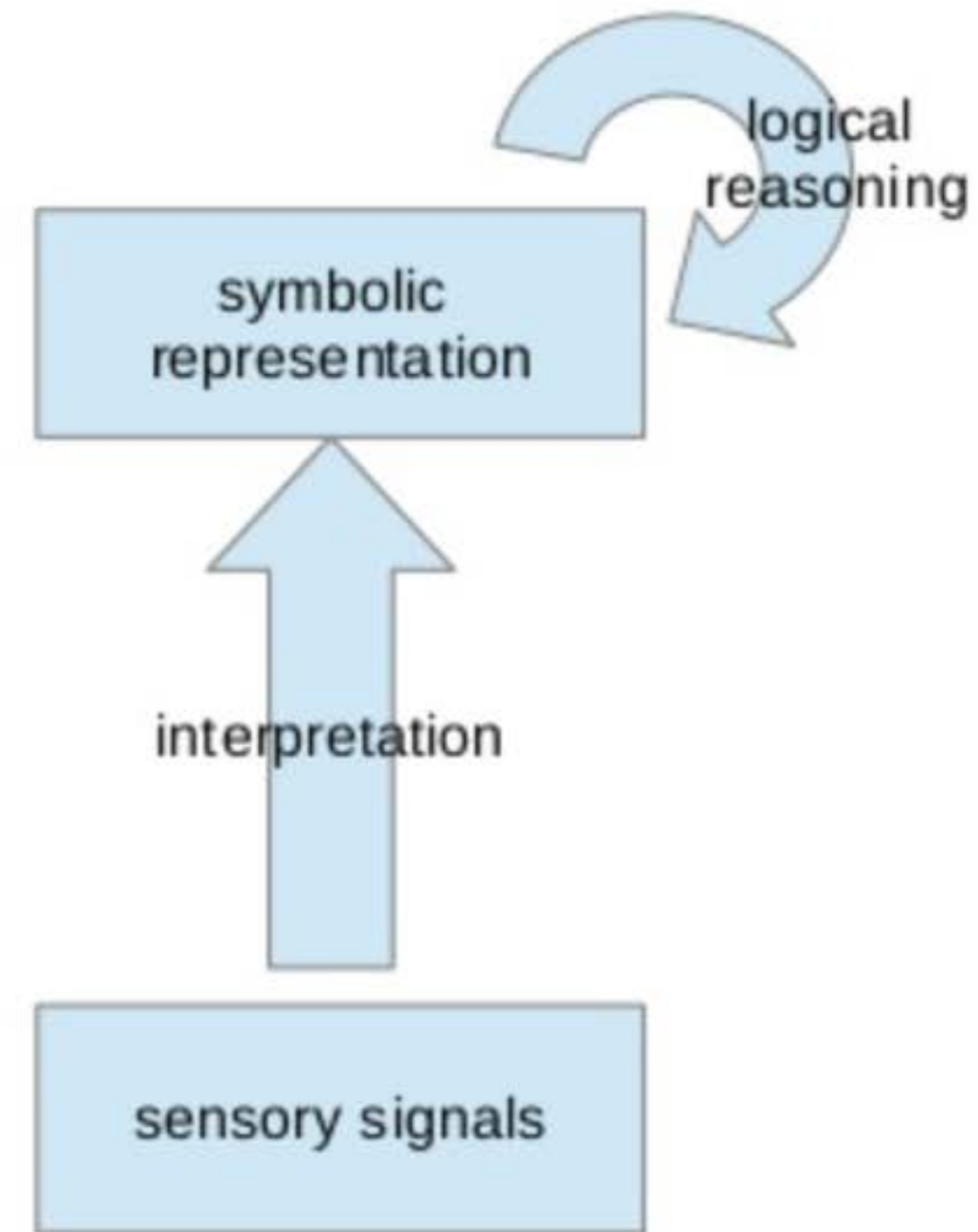
A.I., again?

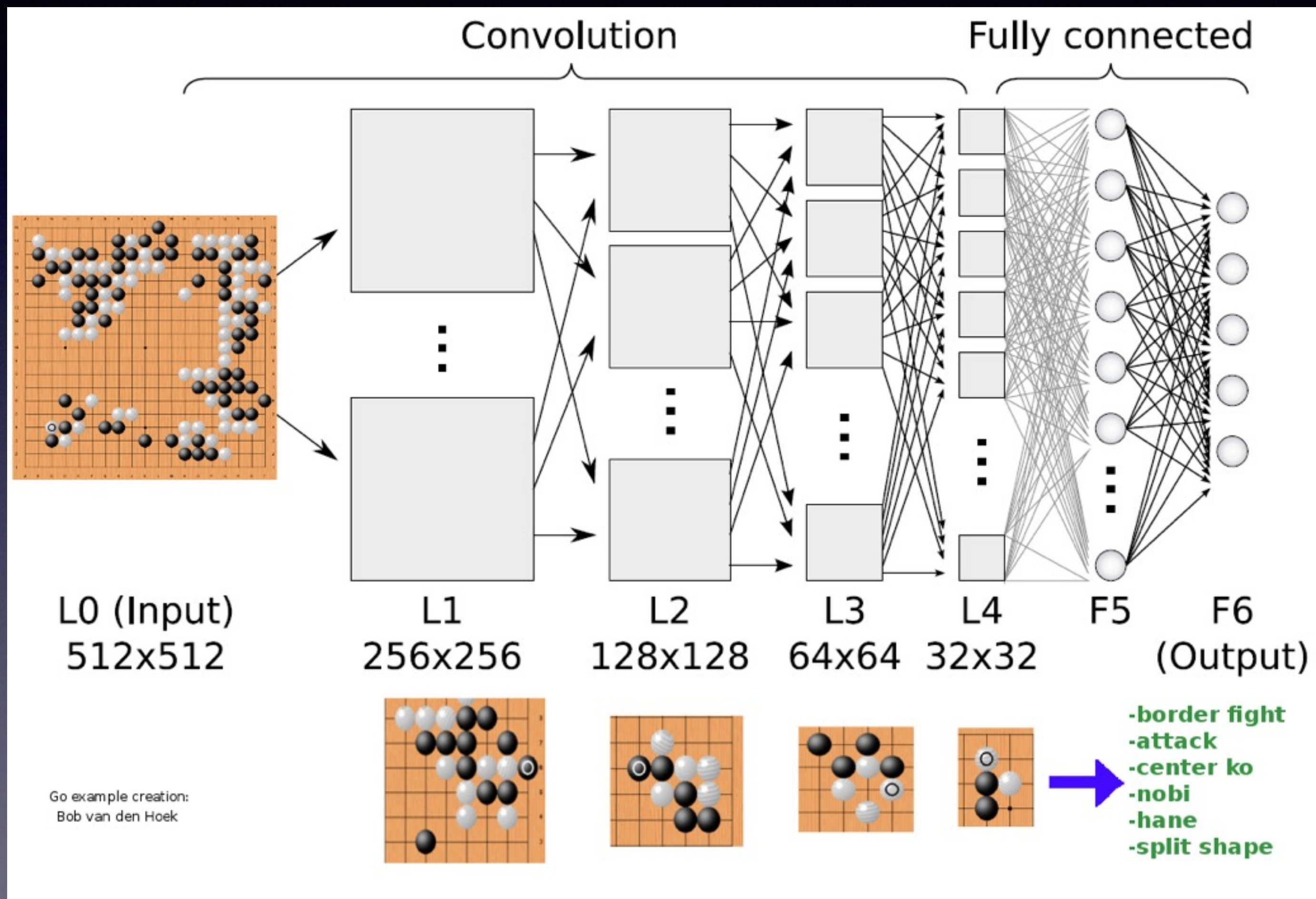
- 人工智能起起伏伏
- 符号主义与连接主义
- 机器学习的兴起
- 深度神经网络一统天下



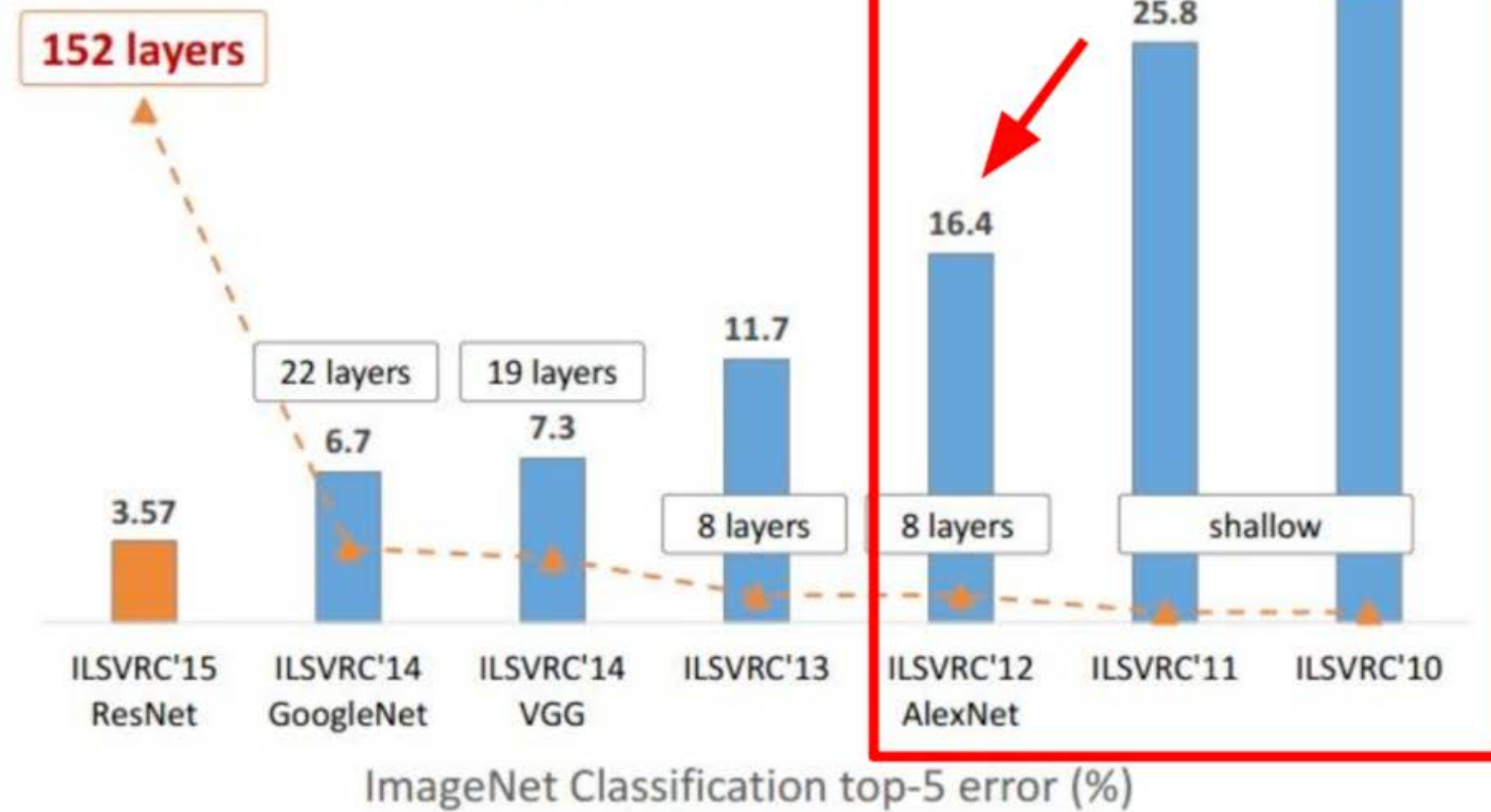
Symbolic AI

- Cognition involves operations over symbolic representations.
- “Perception” is the process abstracting symbolic representations from sensory signals.
- Mostly, the symbolic representation is the product of human design and choice.
- → problem when we go away from the domain of human experience (ie, “semantic gap”)





Revolution of Depth



ImageNet Classification top-5 error (%)

AI Landscape

Players

- ~10K Companies
- Big players



- Second tier/"New" comer



Machine Intelligence LANDSCAPE

CORE TECHNOLOGIES

ARTIFICIAL INTELLIGENCE 	DEEP LEARNING 	MACHINE LEARNING 	NLP PLATFORMS 	PREDICTIVE APIS 	IMAGE RECOGNITION 	SPEECH RECOGNITION
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RETHINKING ENTERPRISE

SALES 	SECURITY / AUTHENTICATION 	FRAUD DETECTION 	HR / RECRUITING 	MARKETING 	PERSONAL ASSISTANT 	INTELLIGENCE TOOLS
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RETHINKING INDUSTRIES

ADTECH 	AGRICULTURE 	EDUCATION 	FINANCE 	LEGAL 	MANUFACTURING 	MEDICAL
OIL AND GAS 	MEDIA / CONTENT 	CONSUMER FINANCE 	PHILANTHROPIES 	AUTOMOTIVE 	DIAGNOSTICS 	RETAIL

RETHINKING HUMANS / HCI

AUGMENTED REALITY 	GESTURAL COMPUTING 	ROBOTICS 	EMOTIONAL RECOGNITION
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SUPPORTING TECHNOLOGIES

HARDWARE 	DATA PREP 	DATA COLLECTION
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Machine Intelligence LANDSCAPE

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SUPPORTING TECHNOLOGIES

HARDWARE 	DATA PREP 	DATA COLLECTION
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MACHINE INTELLIGENCE 2.0

AGENTS

PROFESSIONAL	PERSONAL	OS INTERFACES
Howdy! x.ai clara KASIST DigitalGenius OVERLAP.CC meekan fuse machines PRIMER	facebook XIAOICE large assistant.ai nestor @awesome Magic	Siri Cortana VIV maluuba api.ai COGNEA Google Now

AUTONOMOUS SYSTEMS

AIR	GROUND	SEA	INDUSTRIAL
SDR DJI PROJECT LOON VERTICAL DroneDeploy AIRDOG SKYCATCH SKYDIO Airware LILY	Google UBER TESLA CRUISE MOBILEYE COMMA AdasWorks	LIQUID ROBOTICS bluefin data OPENRBV BluHaptics	KIVA Systems fetch HARVEST CLEARPATH AVIDBOTS ENERGID rethink robotics GREYORANGE OSARO

ENTERPRISE

SECURITY / FRAUD	HR / RECRUITING	SALES	MARKETING	CUSTOMER SUPPORT	INTERNAL INTEL	MARKET INTEL
Sentinel graphistry BITSIGHT feedzai AREA1 drawbridge sift science CYLANCE Brighterion	textio hiQ gild SpringRole entelo unitive GIGSTER	sense infer people pattern Preact Prism AVISO Vidora sentient salespredict Gainsight	LiftIgniter RADIUS brightfunnel retention AIRPR	CLARABRIDGE QUANTIFIND Wisejo ACTIONIQ FRAMED DigitalGenius	Alation ADATAO Palantir sapho lucid Rainbird SKIPFLAG agolo Digital Reasoning Narrative Science	Quid mattermark DataFox bottleneck PREMISE enigma CB INSIGHTS

PLATFORMS

RESEARCH / AGI	FULL STACK	MACHINE LEARNING	INDUSTRIAL IOT	AUDIO	VISION	DATA ENRICHMENT
OpenAI vicarious GoogleDeepMind Numenta Cycorp nnaisense SCALED INFERENCE 格CURIOUS GEOMETRIC INTELLIGENCE	context relevant CognitiveScale NVIDIA TERADEEP QUALCOMM nervana SYSTEMS	Dato rapidminer cortical.io AYASDI amazon web services Azure nara logics PredictionIO SKYTREE bigmi blueyonder	ThingWorx UPTAKE IMUBIT Preferred Networks Alluvium xively PLANET OS	Gridspace TalkIQ nexidia vocaliq NUANCE Expect Labs popUP archive	ORBITAL INSIGHT Descartes Labs DEXTRO cortica clarifai PLANET LABS MetaMind	diffbot Paxata TRIFACTA iDIBON WorkFusion loop@ CrowdFlower

INDUSTRIES

ADTECH	AGRICULTURE	FOR GOOD	RETAIL FINANCE	LEGAL	MATERIALS & MFG	HEALTHCARE
ADTHEORET dstillery BEYONDVERBAL METAMARKETS TARD rocketfuel affectiva	BLUE RIVER tulle TerraAvion mavrx THE CLIMATE CORPORATION CERES TECHNOLOGIES HONEYCOMB	Conservation Metrics DataKind DATA POP thorn BAYES IMPACT	inVenture affirm earnest MIRADOR Lendo zest finance LendUp	Everlaw RAVEL LEGAL ROBOT Sseal BEAGLE ROSS Lex Machina	zymergen AUGMATE GINKGO BIOWORKS ITRINE SIGHT MACHINE TECHNOLOGIES CALCULARIO Eigen Innovations	deep genomics 3SCAN enlitic Calico BLUEBERRY Atomwise Recombine color METABIOTA GRAND ROUNDS Google Life Sciences IBM Watson Health

INDUSTRIES (CONT'D)

EDUCATION	TRANSPORT & LOGISTICS	INVESTMENT FINANCE
KNEWTON coursera turnitin gradescope UDACITY KHANACADEMY	NAUTO taleris PRETECKT clearmetal	Bloomberg Quantopian Dataminr KENSHC ISENTIUM NEURENSIC alphasense

TECH USER TOOLS

DATA SCIENCE	MACHINE LEARNING	OPEN SOURCE
DOMINO kaggle Sentenai sense yseop Outlier yhat DataRobot	Cortana Analytics AlchemyAPI glowfl.sh IBM Watson Platform Anodot MonkeyLearn (h[s]) HyperScience fuzzy.io SIGOPT OxdataH2 SPARKBEYOND indico	SKYMIIND TensorFlow seldon Caffe theano Spark MLlib Microsoft TM spaCy DL4J SciKit CGT

ENTERPRISE INTELLIGENCE

VISUAL Orbital Insight planet clarifai DEEPVISION cortica Igocean SPACE_KNOW Optricity netra deepomatic	AUDIO Gridspace TalkiQ nexidia twilio CAPIO Expect Labs Clover Mobvoi CuriousAI popAI archive	SENSOR PREDIX GYLO MAANA Sentinal PLANET OS UPTAKE IMUBIT thingworx XONUX Alluvium	INTERNAL DATA PRIMER IBM WATSON Cycorp Palantir ARIMO Alation Sapho Outlier Digital Reasoning	MARKET mattermark Quid Datafox PREMISE Bottlenose MOTIVA enigma CB INSIGHTS Tracxn predata
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ENTERPRISE FUNCTIONS

CUSTOMER SUPPORT DigitalGenius Kasisto ELOQUENT Wiseio ACTIONIQ zendesk Pract CLARABRIDGE	SALES collective[i] sense fuse[machines] AVISO salesforce INSIDE SALES.COM clari Zensight	MARKETING MINTIGO Lattice RADIUS LiftIgniter PERSADO brightfunnel retention COGNICOR AIRPR magid	SECURITY CYLANCE DARKTRACE ZIMPERIUM deepinstinct Sentinel DEMISTO graphistry drawbridge SignalSense AppZen	RECRUITING textio entelo Wade & Wendy hi unifive SpringRole GIGSTER HereVue
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AUTONOMOUS SYSTEMS

GROUND NAVIGATION drive.ai AdasWorks ZOOX Mobileye UBER Google TESLA nuTonomy Auto Robotics	AERIAL SKYDIO SHIELD AI Airware DJI LILY DroneDeploy pilot.ai SKYCATCH	INDUSTRIAL JAYBRIDGE OSARO CLEARPATH fetch KINDRED HARVEST rethink robotics	PERSONAL amazon alexa Cortana Allo facebook Siri Replika	PROFESSIONAL butter.ai pogo SKIPFLAG clara x.ai slack talla Zoom sudo
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INDUSTRIES

AGRICULTURE BLUE RIVER mavrx tule TRACE Pivot Terrovision AGRIC-DATA Deercartes Labs udio	EDUCATION KNEWTON volley gradescope CTI coursera UUDACITY alt school	INVESTMENT Bloomberg sentient SENTIUM KENSHO alphasense Dataminr CEREBELLUM CAPITAL Quandl	LEGAL blueJ BEAGLE Everlaw RAVEL seal ROSS LEGAL ROBOT	LOGISTICS NAUTO Acerta PRETECKT Routific clearmetal MARBLE PITSTOP
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INDUSTRIES CONT'D

MATERIALS zymergen Citrine Eigen Innovations SIGHT MACHINE GINKGO BIOWORKS nanotronics CALCULARIO	RETAIL FINANCE TALA zest finance Lendo earnest affirm MIRADOR wealthfront Betterment	PATIENT PULSE CareSkore ZEPHYR HEALTH Watson Health Oncosis SENTRIAN Atomwise Numerate	IMAGE BUTTERFLY 3SCAN ARTERYS enlitic BAYLABS imago Google DeepMind	BIOLOGICAL iCarbonX color GRAIL deep genomics RECURSION LUMINIST Numerate Atomwise verify WHOI
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AGENT ENABLERS

OCTANE.AI howdy. Maluba KITT.AI
OpenAI Gym Kasisto AUTOMAT
semanticmachines

DATA SCIENCE

DOMINO SPARKBEYOND rapidminer
kaggle DataRobot yhat AYASDI
data lku seldon yseop bigml

MACHINE LEARNING

CognitiveScale GoogleML context relevant
Cycorp HyperScience noro logics minds.ai H2O.ai
SCALED INFERENCE sparkcognition loop GEOMETRIC INTELLIGENCE
deepsense.io reactive skymind bonsai

NATURAL LANGUAGE

agolo AYLIEN LEXALYTICS
Narrative Science loop@ spaCy LUMINOSO
cortical.io MonkeyLearn

DEVELOPMENT

SIGOPT HyperOpt fuzzyio pkite
rainforest lobe Anodot
Signifai LAYER 6* bonsai

DATA CAPTURE

CrowdFlower diffbot CrowdAI import
Paxata DATASIFT amazon mechanical turk enigma
WorkFusion DATALOGUE TRIFACTA parsehub

OPEN SOURCE LIBRARIES

Keras Chainer CNTK TensorFlow Caffe
H2O DEEPLARNING4J theano torch
DSSTNE scikit-learn AzureML neon
MXNet DMTK Spark PaddlePaddle WEKA

HARDWARE

KNUPATH TENSTORRENT Cirascale
NVIDIA intel nervana Movidius
tensilica GoogleTPU 10th Labs equalcomm
Cerebras Isosemi

RESEARCH

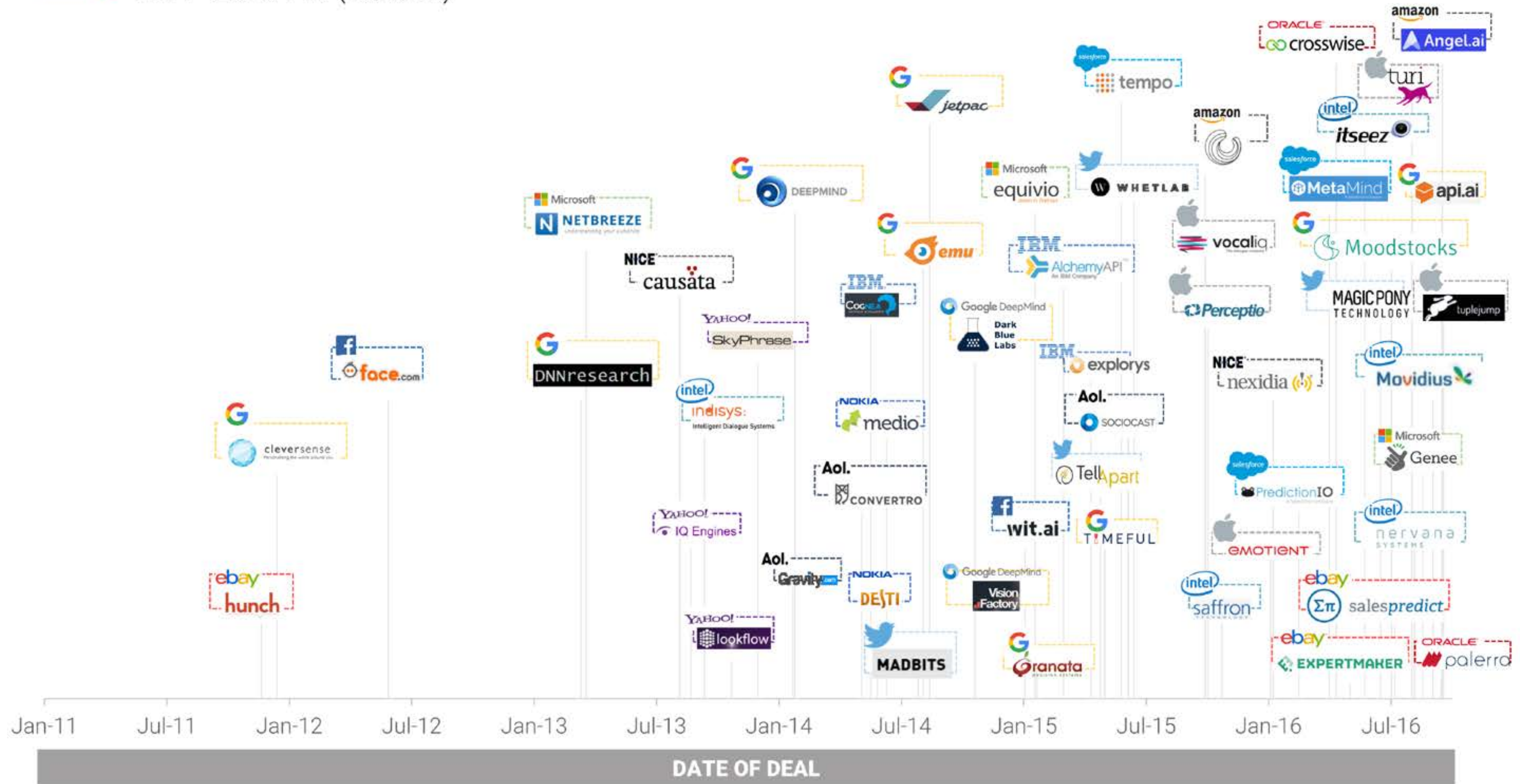
OpenAI meibohm ELEMENT^{AI} vicarious
KNOGGIN Numenta Kimera Systems Cogitai

AI Opportunities



RACE FOR AI: MAJOR ACQUIRERS IN ARTIFICIAL INTELLIGENCE

2011 - 2016 YTD (10/7/16)





60+ STARTUPS USING DEEP LEARNING

CORE AI: COMPUTER VISION



CORE AI: OTHER



BI, SALES & CRM



CORE AI: VOICE INTERFACE



ROBOTICS & AUTO



HEALTHCARE



SECURITY



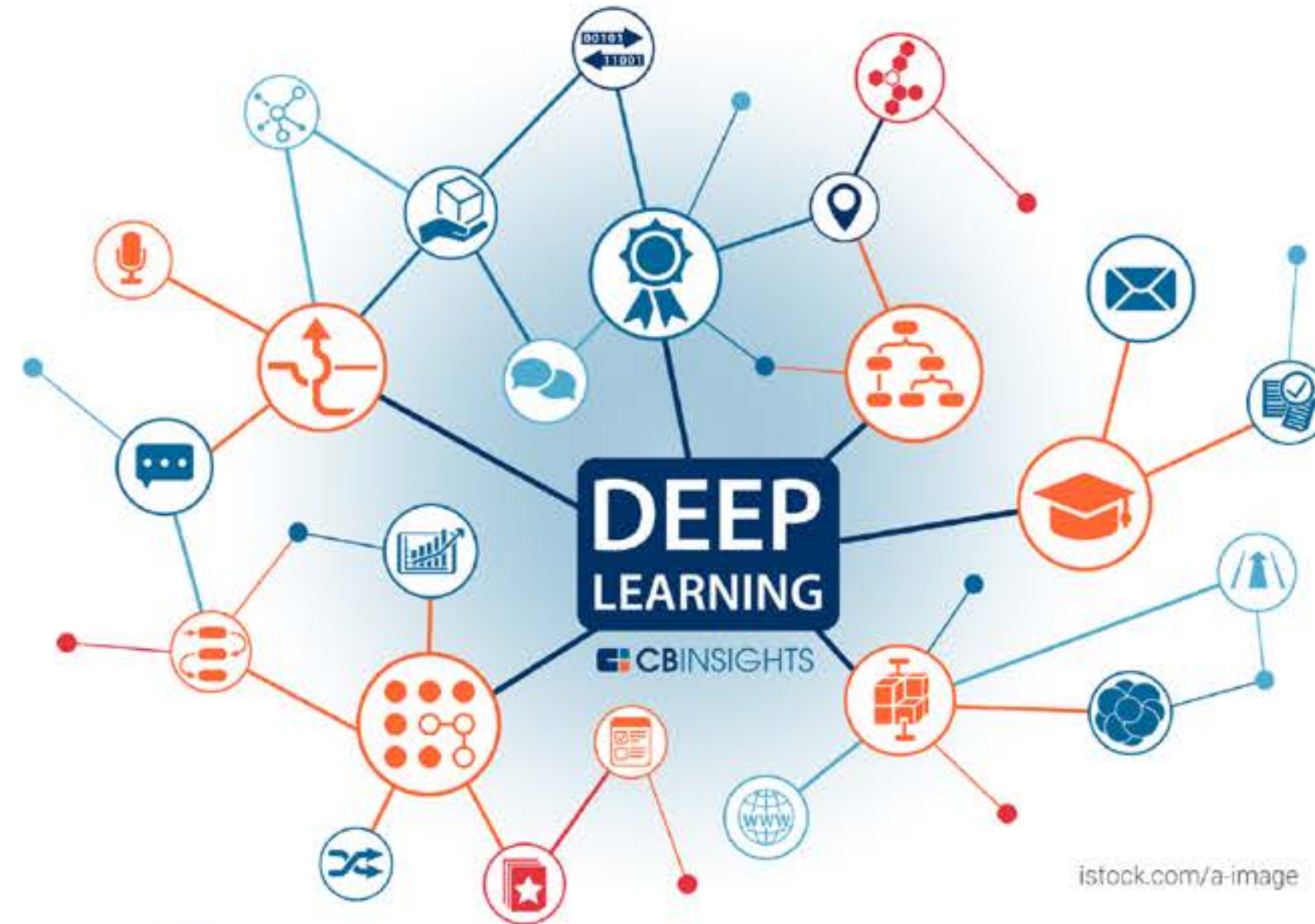
OTHER



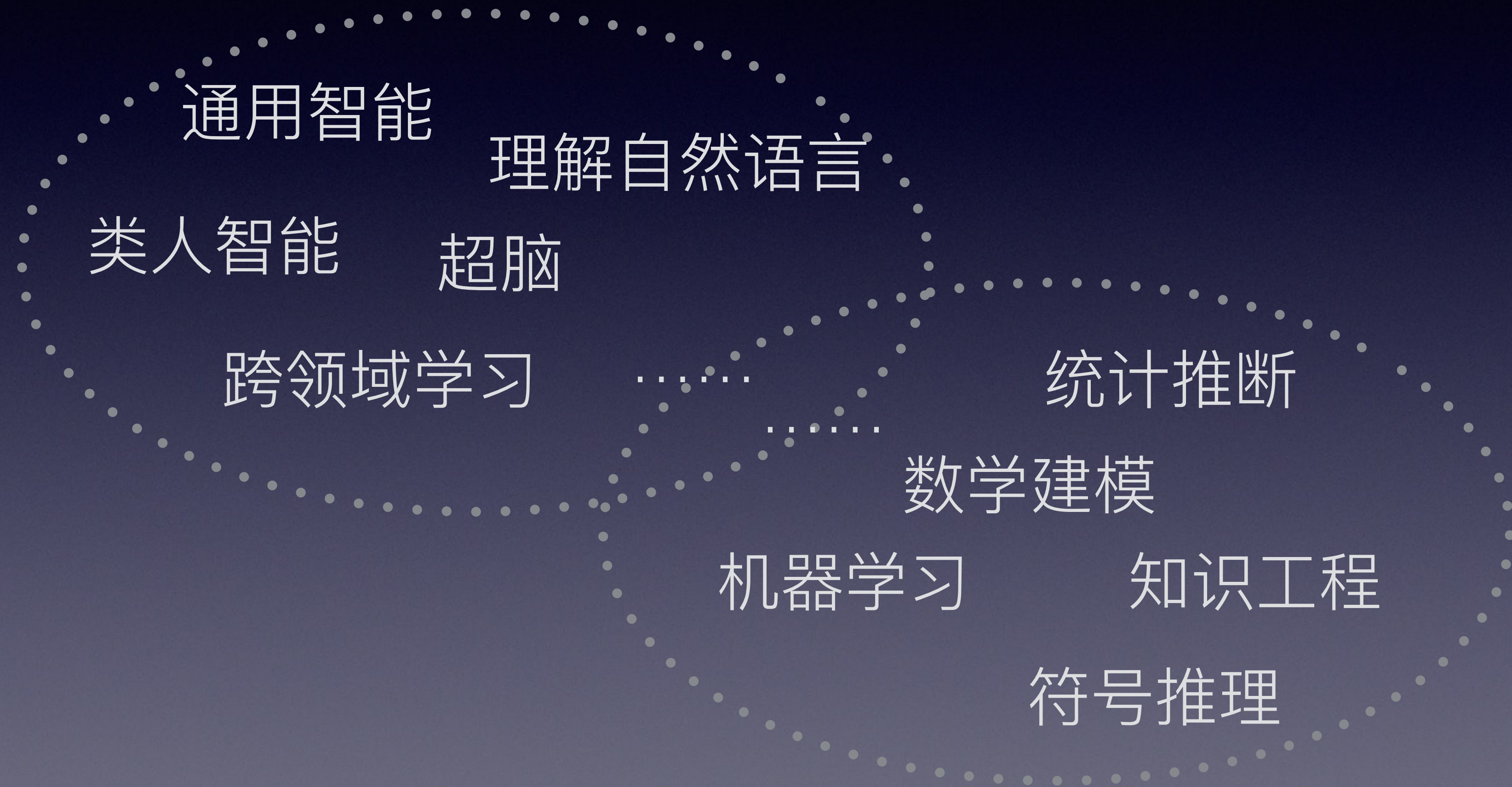
E-COMMERCE



ACQUIRED (2014-2016YTD)



强 AI / 弱 AI ?



–Johnny Appleseed

人工智能 = 人工 + 智能?

–Johnny Appleseed

人工智



智能?