# Artificial Intelligence (AI) Machine Learning (ML) Natural Language Processing (NLP) Analytics



Hal – a Space Odyssey 2001

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**ADVOKATER** 

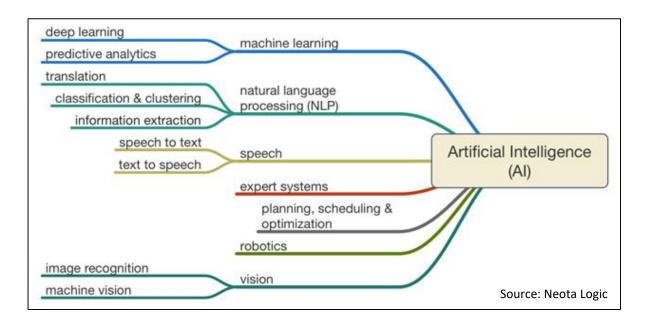
Bjarne Schøn bschon@bschon.com +45 5043 3837

# "AI has by now succeeded in doing essentially everything that requires 'thinking' but has failed to do most of what people and animals do 'without thinking.""

Donald Knuth, Computer Scientist

# What is Artificial Intelligence

- A computer system that can perform/mimic tasks normally requiring human intelligence
  - E.g. learning, problem solving, visual perception, speech recognition, decision making, ....
- Requires (today) human beings to develop the algorithms and teach the system what to look for
  - E.g. words, sentences, patterns, exceptions, anomalies,..... i.e. "filling in the blanks" for the algorithm to work
  - Some systems (Cognitive, Deep Learning) can modify the algorithm as the system learn (becomes smarter)
  - The system becomes more and more accurate (smarter) the more it is used
- Usage areas:
  - Due diligence, contract review, predictions on case outcomes, assets and properties, legal search and -research, ....





# Types of Artificial Intelligence

• The human brain:

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- Can process ~10 quadrillion calculations per second on just 20 watts of power
- Applied AI (Weak):
  - A machine that can only simulate the mind and human behavior
- General AI (Strong):
  - A machine that is capable of performing any task to the standard of a human
  - Expected to happen around 2030/2040
- Super Al:
  - A machine that is more advanced than the human brain
  - Expected to happen hours/days after General AI....
  - Will quickly become millions/billions times more advanced than the humain brain

- Predefined Purpose AI (IBM Watson, Apple Siri,....)
  - Pre-programmed to what it should do
- General Purpose AI (Google DeepMind)
  - Learns from experience i.e. is not pre-programmed
- Roles that require lateral, creative thinking, empathy or social sensitivity are the hardest to automate
- Estimate:
  - 50% of all of today's jobs across the globe will be serviced by AI in 2050

# Why use AI in Legal

- Fast can save 20-90% of the time it takes a lawyer to do the same work
- Accurate the quality of the outcome increases the more the solution is used. Accuracy quickly reaches +90%. A
  human being typically has an accuracy of ~85%
- Meticulous finds clauses, wordings etc. that lawyers would normally not find
- **Tireless** works 24/7 with the same speed and quality all the time
- Inexpensive costs less than a digital data room
- Frees up time lawyers can focus on more value creating tasks for the customers
- Improved profit reduced costs and less time spent on tasks that the lawfirm normally can't charge full/normal fees for
- Improved jobsatisfaction lawyers can focus their time on more interesting challenges vs. read tons of documents to find certain clauses etc.

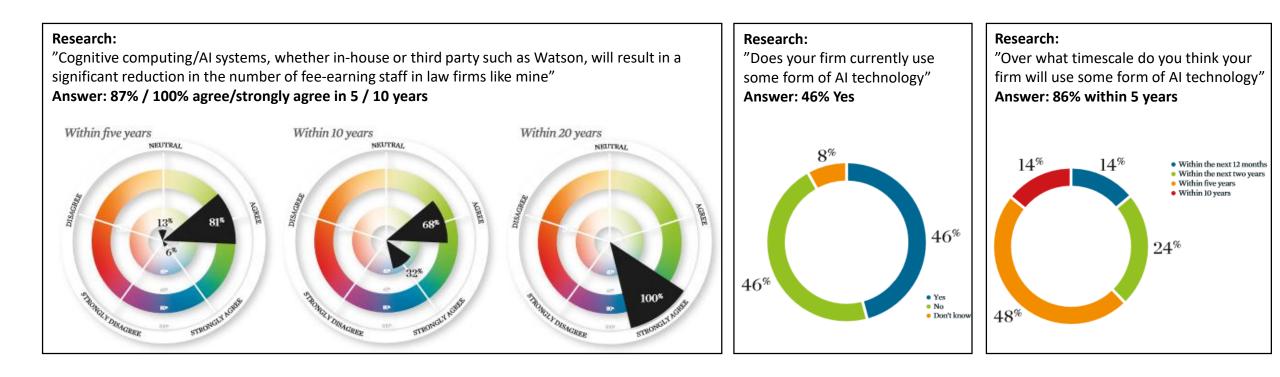
# General observations about AI in Legal

- Most AI solutions today need to be trained by humans in order to deliver value / high accuracy in results
- Depending on the complexity of the task to be executed, training of the AI solution may take considerable time time that typically cannot be charged to a customer
- Once trained, the solution becomes smarter and more accurate, the more it is used
- Al solutions already exist and more are on the way that are "pre-configured/pre-trained" i.e. requires little/no training. Known as "Self Service Portals" or "Pay-as-you-go Portals" (e.g. Luminance, RAVN's Extract Direct,...)
- The solution will retain the knowledge in the firm when a lawyer / partner / subject matter expert leave the firm i.e. loosing a good lawyer may be less of an issue in the future
- Cost of using AI in a due diligence project today (likely to change significantly in coming years) varies greatly
  - Luminance: ~EUR 1.200/GB\*; RAVN: ~EUR 5.000 for 100 contracts (incl. setup)\*\*; Kira: ~EUR 10.000 per project
- Potential issues w. Al solutions:

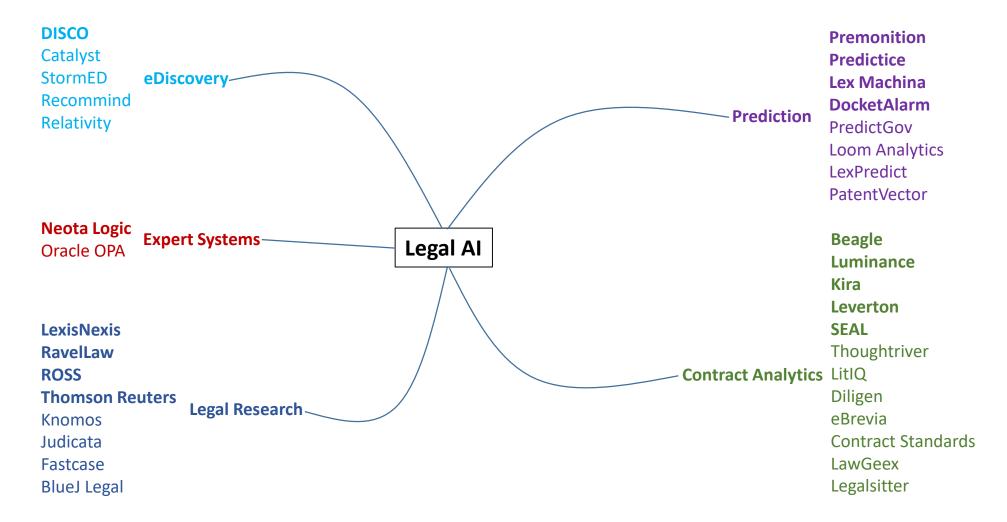
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> Integration to data rooms (encrypted data + access/login), Languages (non-English) and new areas (outside of due diligence/contract mgmt.) may require significant training

# Research on Al in Top 100 Law Firms



# Al systems by category





Video w. a doctor around AI in Medical: https://www.youtube.com/watch?v=27zPBWSBs-g

### No – not on the short term!



Video of Sophia – Al Robot: <u>https://youtu.be/W0\_DPi0PmF0</u>

.... and definitely not as long as the solutions cannot represent empathy or emotions

# Al can be biased and inefficient across jurisdictions

 In 2016, an investigation by news organization ProPublica found that an algorithm used by the US justice system to determine whether criminal defendants were likely to reoffend, had a racial bias.

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- Black defendants with a low risk of reoffending were more likely than white ones to be labelled as high risk.
- M&A cases often have different jurisdictions making it difficult to use standard algorithms
- Legal documents are open to interpretation and tacit assumption which (currently) require human input

### Racistisk Microsoft-chatbot nedsmelter totalt

Det var en stakket frist for Microsofts Twitter-robot Tay, der i sidste uge var racist og onsdag genopstod ved en fejl for derefter at gå i baglås.



Tay blev racist på rekordtid, forsvandt og genopstod som rebelsk hashryger. (Foto: skærmdump)

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# Extract of Leading AI Solution Providers

# RAVN



#### LOCATION: UK URL: https://www.ravn.co.uk/ **GRAVN** Products Services Industries Company Q INFO: SOLUTION(S): The Power of Understanding Your Documents Founded 2010: 51 - 200 employees. Acquired by iManage 24<sup>th</sup> May 2017 Meet ACE: A robot who organises, discovers and summarises data RAVN ACE - Applied Cognitive Engine ~45 law firm customers – in DK: Bech Bruun RAVN **Connect** – Advanced Enterprise & Kammeradvokaten (Enterprise search) and search DJØF (employment contracts) RAVN Extract Direct - Due Diligence & **Requires RAVN people to setup solution** Contract Analysis – plug n' play (no training Requires training in Danish language 000 of the AI solution required) RAVN sets the pace of Price: ~EUR 5.000/100 contracts (Incl setup) \_ Discover Search Tac Summarise, Analyse, Extract the market. RAVN Refine - Categorize data into clear BLP Real Estate Group: "Completes two weeks work in ~two seconds!" scopes and refinements RAVN LLP Robot - Doc. Review for legal **FUNCTIONAL AREAS:** professional privilege (eDiscovery) Process, Read & Analyze Documents Organise ..... RAWN extract tent sets and add structur Data Extraction and comparison Distil Due Diligence & Contract Analysis Interrogate **GDPR** compliance ..... Accelerate GRAVN document sets with the ISDA/CSA Review & Provisions impacted by Discover ..... Demo Video: Intro Video: Brexit nactive, duplicate https://ravn.wistia.com/medias/fgc85hiw83 https://www.youtube.com/watch?v=XdTLLg6mKf0 Classify 0= **Employment Contract Analysis** ⑦ Dashboard Al Data Enrich Disk space 22.25 TB Costs £155.770.18 Documents 4.597,600 Extend ..... **Business driver** 67% 8% 0% **0%** 7.45 GB 16% Surface ..... Connect Requirement knowledge and third party feeds. Discover $( \land )$ . Outcome Collaborate Expose between knowledge

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# Kira



### LOCATION: Canada

### INFO:

- Founded 2011: 11-50 employees
- Does not require a Machine Learning expert – developed by and for lawyers
- Handles 60+ formats of std. and non-std. forms
- Price: ~EUR 10K per "project"
- Saves 20-90% of time on contract review projects (non-trained vs. trained)

### **FUNCTIONAL AREAS:**

- Contract review, analysis & mgmt.. Contract Risk mgmt. & Compliance
- Due diligence for M&A and Divestitures
- Post-merger integration / separation
- Regulatory reporting and compliance
- Lease Abstraction auto-extract and summarize provisions from leases

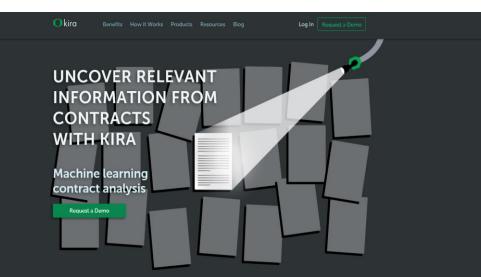


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OLUTION	(S):	

**URL:** https://kirasystems.com/

- Kira Quick Study create custom provisions and find virtually any relevant contract information
- Kira Standard: < 10K docs p.a.; Secure Cloud; 2 built-in provision groups e.g. change of control, assignment, license grants, indemnity
- **Kira Professional**: Regular contract reviews; Private Cloud; 4 built-in provision groups; API access
- Kira Enterprise: Your own technical environment; On-premise; 4 built-in provision groups; API access



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Intro Video: https://vimeo.com/185328372

### Luminance



### **LOCATION: UK**

### URL: https://www.luminance.com

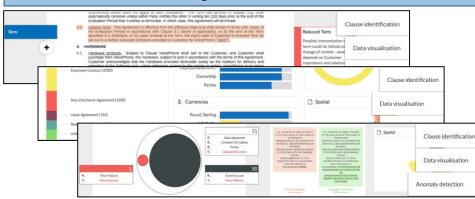
#### INFO:

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- Founded 2015: 11 50 employees
- Does not require training of the solution deployed "out-of-the-box" – Plug n' Play
- 8 law firm customers in Nordics: Roschier and BAHR
- Price: ~EUR 1.200/GB (1GB = ~65K 650K pages)
- Awarded "Best AI in Legal Tech" by the Global
   Annual Achievement Awards for Artificial Intelligence
- Cuts research time by 50% (Slaughter & May)

#### **FUNCTIONAL AREAS:**

- The solution can in principle be used for any project that requires detecting anomalies – not just in Due Diligence
- Detects patterns in 21 languages and identify anomalies – without being told what to look for



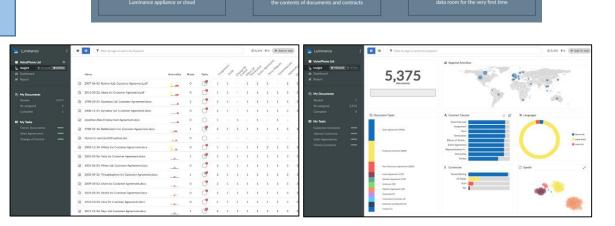
### SOLUTION(S):

- Analyses clauses, extracts data and reports exceptions
- Sorts by document and clause type, currency, language and location to make navigation of the data room more intuitive

Cloud or on premise

Big Data Visualization – can read and interpret photos and diagrams from e.g. PowerPoint slides or photographs of old documents etc.

range between 50-60% of jobs." Automation is going to complete augment specialist human knowledge, not to replace it. Individua growth of the digital universe. A report from the International Da reached in 2005. No human individual or team can hope to searce and understanding these unwieldy amounts of data is artificial to	als and businesses to deal with documents to legacy approaches rely heavily on keywe h would never be able to find this text. Rece delligence years there have been many at th	s in Luminario uses, fro betitive tasks. Algorithm and language need to us wit search. Well globally mit breakthroughs every et University of Cambrid	in highly cognitive fields a fanguage technique and to from 2020 keyword going to risk and irregularity in that ge intelligence to the enable	dpoint. Estimates for such as law, artificial of at their disposal t o grow to over three may be in the corpu d of the expanding	the United States and Europe intelligence will be used to o combat the exponential hundred times the levels s. A new approach to handlin, ligital universe. However, the	e 8. ty	
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science-fiction. The research white umbrave the Dartmouth there d beginning to see real world will be seen of AI and machine in a - gaming experts by repeatedly beating the world champion at ind- the real benefitied of artificial intelligence lie outside the realment achievement. AI systems that can play chess, with complexity in a monumental paradigm shift. Attempts to teach machines to go a monumental paradigm.	initig of 1956 demands for the test of AI con- We've seen AI whole new light. AI an maste mice the strategy fiction is now reality. This a paming, Computers can machine learning re- stonishing, their rise was generally and rel- ativanise, human languages relied strongly c	uld be dealt with in just- ers and idea that reigning game in we are a real bel- ather than A 21st century atively needed to step in an like process input of u	one summer. The possible as g champions of game belong leved to rely too heavily woo s augmenting teams approa a machine learning. Luminas nwieldy sets of rules. A rule	rvice overly optimized to. Most recently rld application for a providing insight nee's ability to under a or signature-based	tic, but at last we are Google's AlphaGo sturmed computer to crack it. Howeve s that enhance human stand language as humans de approach is last all y flawer	n d:	
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Luminance is a new class of document analysis softw. to big data. Trained by legal experts, the revolu breakthroughs in artificial intelligence at the Univers	tionary technology is founded on					11-	
Luminance understands language the way humans humans will never achieve. It provides an immer company, picking out warning signs without needing.	diate and global overview of any any instruction.						
Luminance adds value to a legal team, freeing lawyers	s to focus on what matters.			1	SV		
Request demo							
Request demo							



### Leverton

### **LOCATION:** Germany

### URL: https://leverton.ai/

### INFO:

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- Founded 2011: 51 200 employees
- 100+ customers (not only law firms)
- User friendly plug n' play Leverton staff not involved in projects
- Partnership with SAP

### **FUNCTIONAL AREAS:**

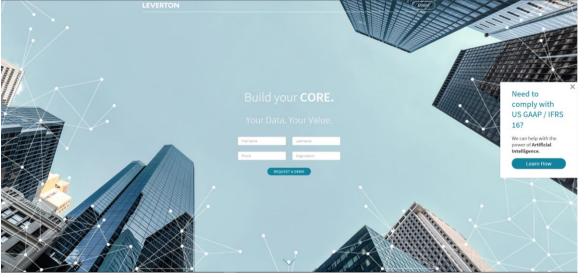
- Document & contract mgmt., Due diligence, Real estate, Asset & Property mgmt., Lease abstraction
- Extract provisions from legal documents as attributes not text
- Attributes: what a clause means not what it states/how it is phrased
- Language agnostic can be accessed in 21 languages w. no need for translation
- Interfaces (APIs) to ERP systems (SAP,...)

#### How to **simplify** your transition $\bigcirc$ $\bigotimes$ Q Collect all Find information $\geq$ Feed into your accounting system leases faster Compile global leases in more than Ensure complete and up-to-date Save up to 75% time & cost on 20 languages in one platform. lease review. Relevant information is information in your ERP system. Prepare your balance sheet. extracted automatically.

### SOLUTION(S):

- CORE real estate engine focus on lease documents
- Secure Cloud

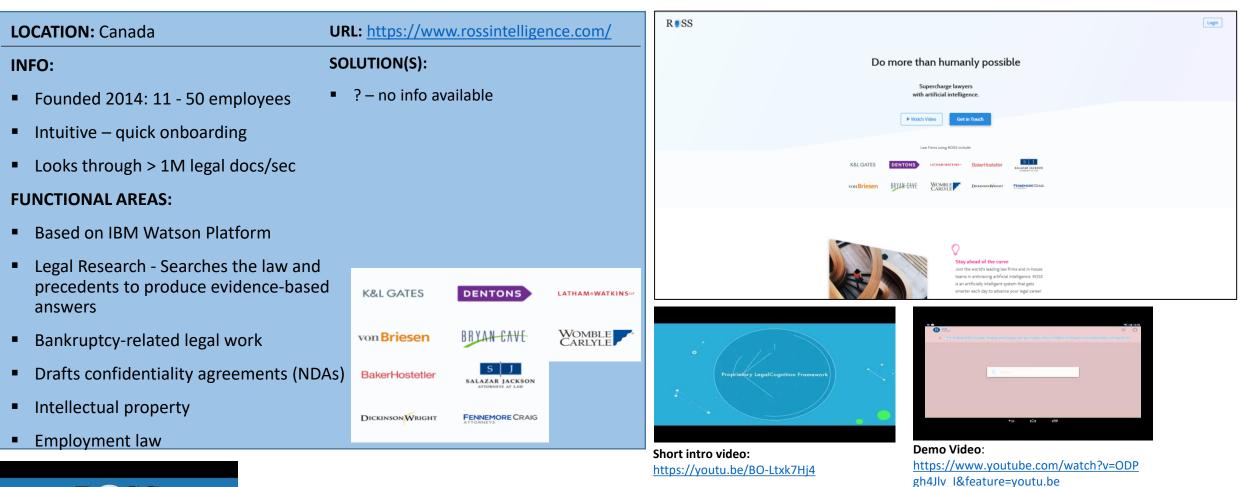




Faster Fact Finding	Tenant	Annual rent	Rent				
ruster ruet mang	Peter Burns LLC	\$ 50.560,00	Seventy nine thousand and eighty pounds (79.080 GBP) per annum				
Tap a cell in your table to jump to the relevant sentence in a document.	John Briggs & Co	GBP 79.080,00	(exclusive of value added tax), subject to review				
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LEVERTON

# ROSS





Intro video: https://youtu.be/ZF0J\_Q0AK0E

# Predictive Analytics Solutions

- Predict the outcome of court cases based on multiple criteria, including the courthouse, the judge and type of case.
- Help lawyers decide whether the case is worth taking to court at all and therefore avoiding unnecessary and substantial costs for their client
- Predictice <u>https://www.predictice.com/</u>
  - Predict the likely outcome, costs, duration, etc of legal cases
  - Set up alternative routes through a case and which route(s) have the highest likelihood for success
  - Identify alternative conflict resolution options than a court case
  - Provide the lawyer an opportunity to price the case according to the risk
- Premonition <a href="https://premonition.ai/">https://premonition.ai/</a>
  - Judge report Video: <u>https://youtu.be/RcymU2SsZGc?list=PLAIMfwckplcwkIuUYKjGFlcLr0rhlikMK</u>
- Ravel Law <u>http://ravellaw.com/</u>
  - Court analytics Video: <u>https://vimeo.com/194135471?from=outro-embed</u>
  - Judge analytics Video: <u>https://vimeo.com/163718987</u>
  - Case analytics Video: <a href="https://vimeo.com/163718479">https://vimeo.com/163718479</a>
  - Ravel law & Harvard University Video: <u>https://www.youtube.com/watch?v=kwlN\_vhai84</u>
- Lex Machina https://lexmachina.com/
- Docketalarm <u>https://www.docketalarm.com/</u>











# Neota Logic – Al Expert System

SOLUTION(S):

**NDAs** 



### LOCATION: US

### URL: https://www.neotalogic.com/

Neota Logic Systems (NLS) Reasoning

Decision tables, Multi-value variables

NLS Workbench – Visual drag n' drop tool for building apps w. automatic

testing, debugging and documentation

**PerfectNDA** - Fully automated creation, negotiation, execution and filing of your

Engine w. decision trees, If/then mapping,

### **INFO:**

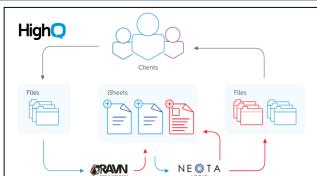
- Founded 2010: 11 50 employees
- Development of apps without coding – drag n' drop tool
- Expert system typically used together with other systems, e.g. RAVN (AI), HighQ (Workflow)

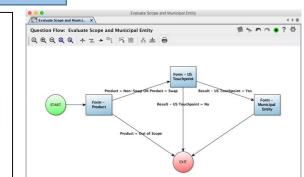
### **FUNCTIONAL AREAS:**

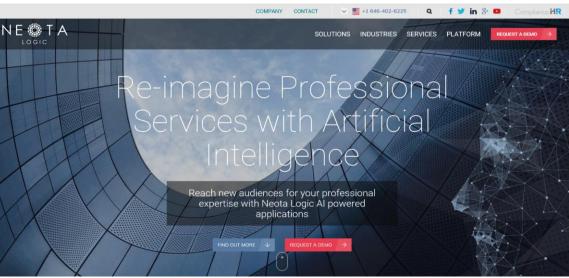
- Integration to several external systems, HighQ, SharePoint, iManage, K2, Nintex, OpenText and databases – various SQL versions
- Lease contract review & risk assessment in collaboration w. HighQ and RAVN



Overview Demo: https://youtu.be/2AGbGa5hdy4









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# Additional Reading

# When Google made a "giant leap" of 10 years!

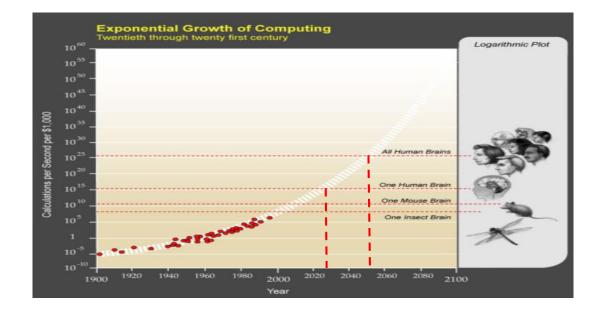
Google's DeepMind won over the grand master Lee Sedol in the game "GO"

• The game "GO":

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- The most complex strategy game in the world More possible moves than atoms in the universe! => impossible for a computer to calculate all possible moves on the board!
- Google DeepMind a new kind of AI:
  - Deep Reinforcement Learning = General Purpose AI (learns from experience i.e. is not pre-programmed)
  - Trained with 100.000 different games/outcomes + played against itself 40M times to learn from it's mistakes!





### Most active Corporate investors in AI: 2011 – 2016

Investor	Rank	Select Investments
Intel Capital	I	DataRobot @ prelert lumiata MAANA Discoming saffron PERFANT eMOTIENT & Reflektion Parallel Machines MindMeld Smortzip Spapi.ai Inclisys: Methydre Datagee Systems COLDLIGHT
Google Ventures	2	Clarifai KENSHO FRAMED Z REPHYR Unbabel
GE Ventures	3	ARTERYS AYASDI BITSTEW MedAware PingThings Stem Predixion MAANA
Samsung Ventures	4	Vicarious sentiance Maluuba idibon jibo
Bloomberg Beta	4	Orbitol Insight       Context relevant       AVISO       howdy.       Context relevant         Orbitol Insight       DigitalGenius       CO       DIFFBOT
In-Q-Tel	6	
Tencent	7	C DIFFBOT acoudmedx' SI SCALED INFERENCE X ICarbonX skymind
Nokia Growth Partners	8	* rocketfuel // WorkFusion // rapidminer indix.
Microsoft Ventures	8	ROBOTICS R ROBOTICS R ROBOTICS
Qualcomm Ventures	8	clarifai 2 Predilytics- Welltok. 🇰 tempo
Salesforce Ventures	8	DigitalGenius () insidesales (sense
AXA Strategic Ventures	8	NEURA BLABEATS Medlanes pricemethod
New York Life Insurance Company	8	

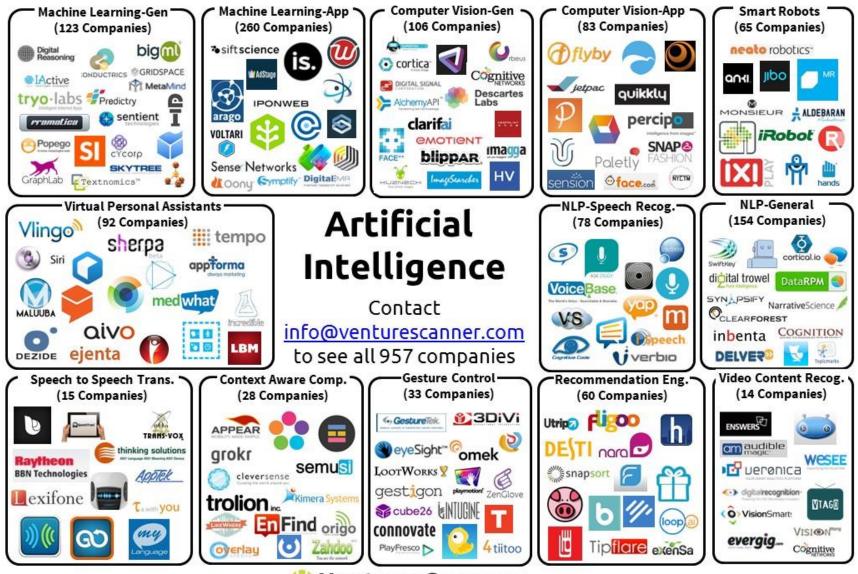
### Most funded AI startups in the USA



Source: CB Insights – January 2017

Source: CB Insights – 15th June 2016

# Al startup overview – Not LegalTech specific



🌐 Venture Scanner