

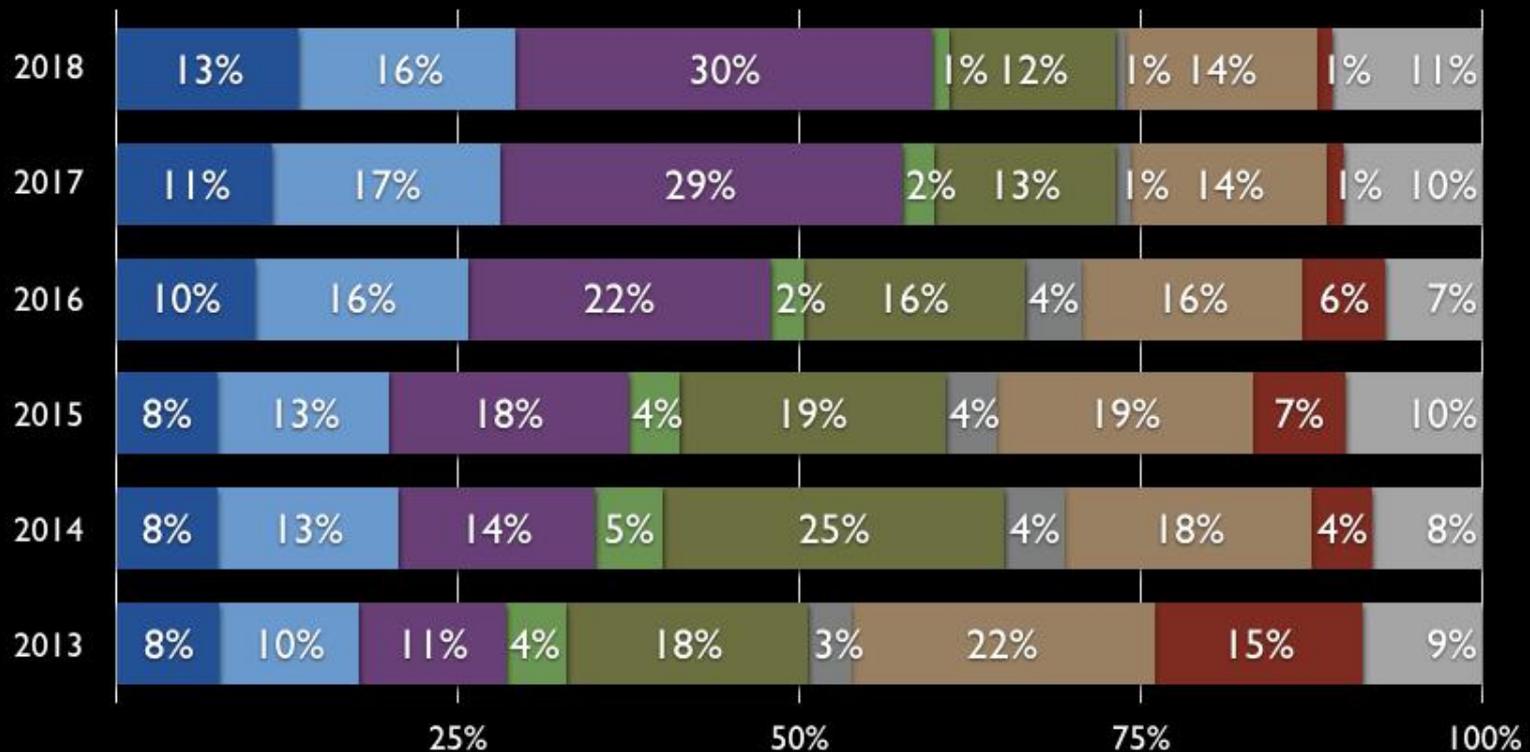
Practical Legal Services Applications of AI

Abhijeet Chavan

Tyler Technologies, Inc.*

*This material contains my personal opinion only and
does not represent my employer's products or services.

Legal Services Websites by Platform



2013 N = 153 2014 N = 160 2015 N = 159 2016 N = 167 2017 N = 167 2018 N = 164

AI

“ There’s nothing artificial about **AI**.

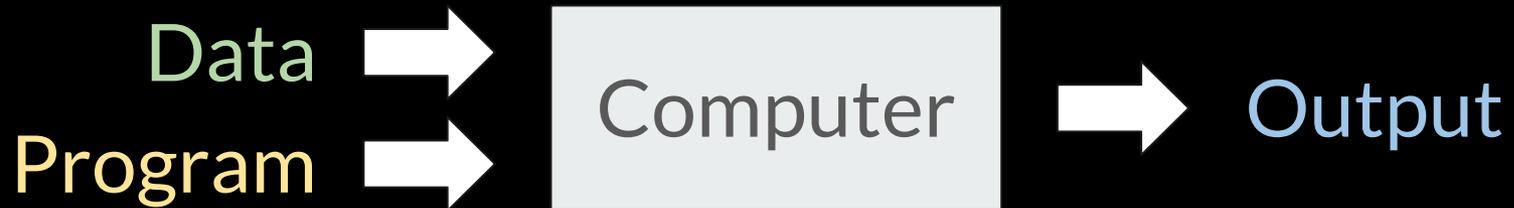
It’s inspired by people,
it’s created by people,
and—most importantly—
it impacts people. ”

— *Fei-Fei Li*

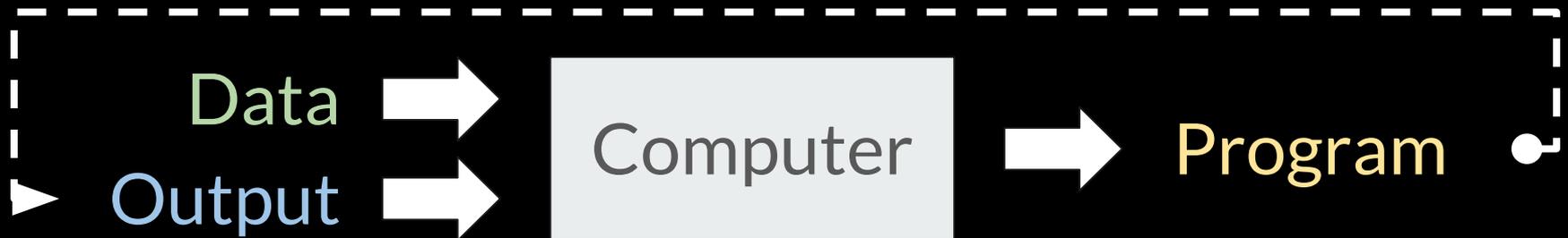
Source: <https://www.wired.com/story/fei-fei-li-artificial-intelligence-humanity/>

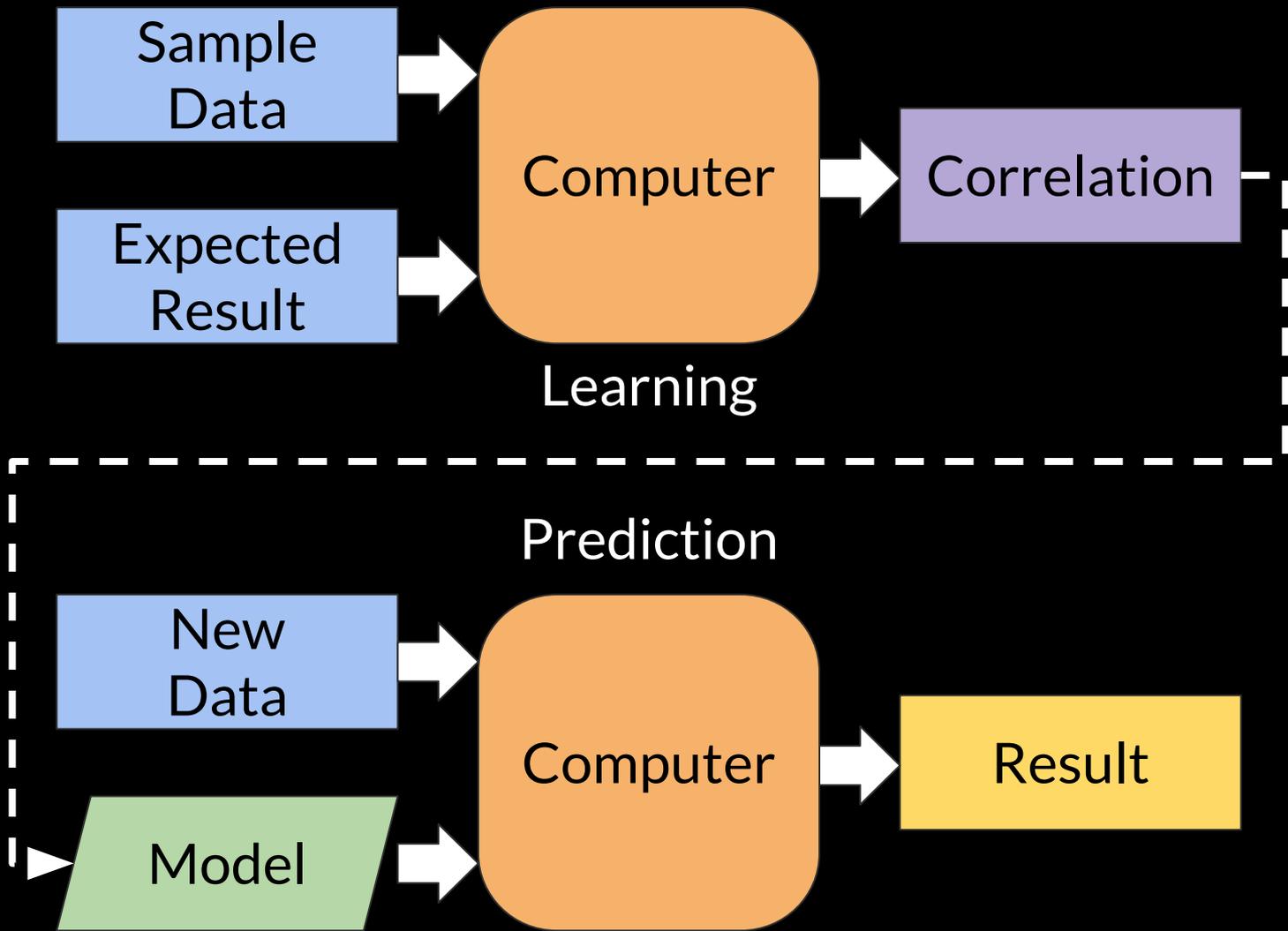
Automate Insights

TRADITIONAL PROGRAMMING



MACHINE LEARNING





Source: Virginia Dignum https://drive.google.com/file/d/15gcKIQj0Ev_LeqsEB3ldzhRXeNEMeiZI/view

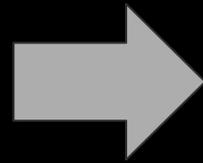
1. Appropriate data
2. Data preparation
3. Suitable algorithms
4. Meaningful correlations
5. Evaluate model regularly
6. Audit results regularly
7. Handle edge cases
8. Maintain system
9. Provide alternatives

Types of Machine Intelligence

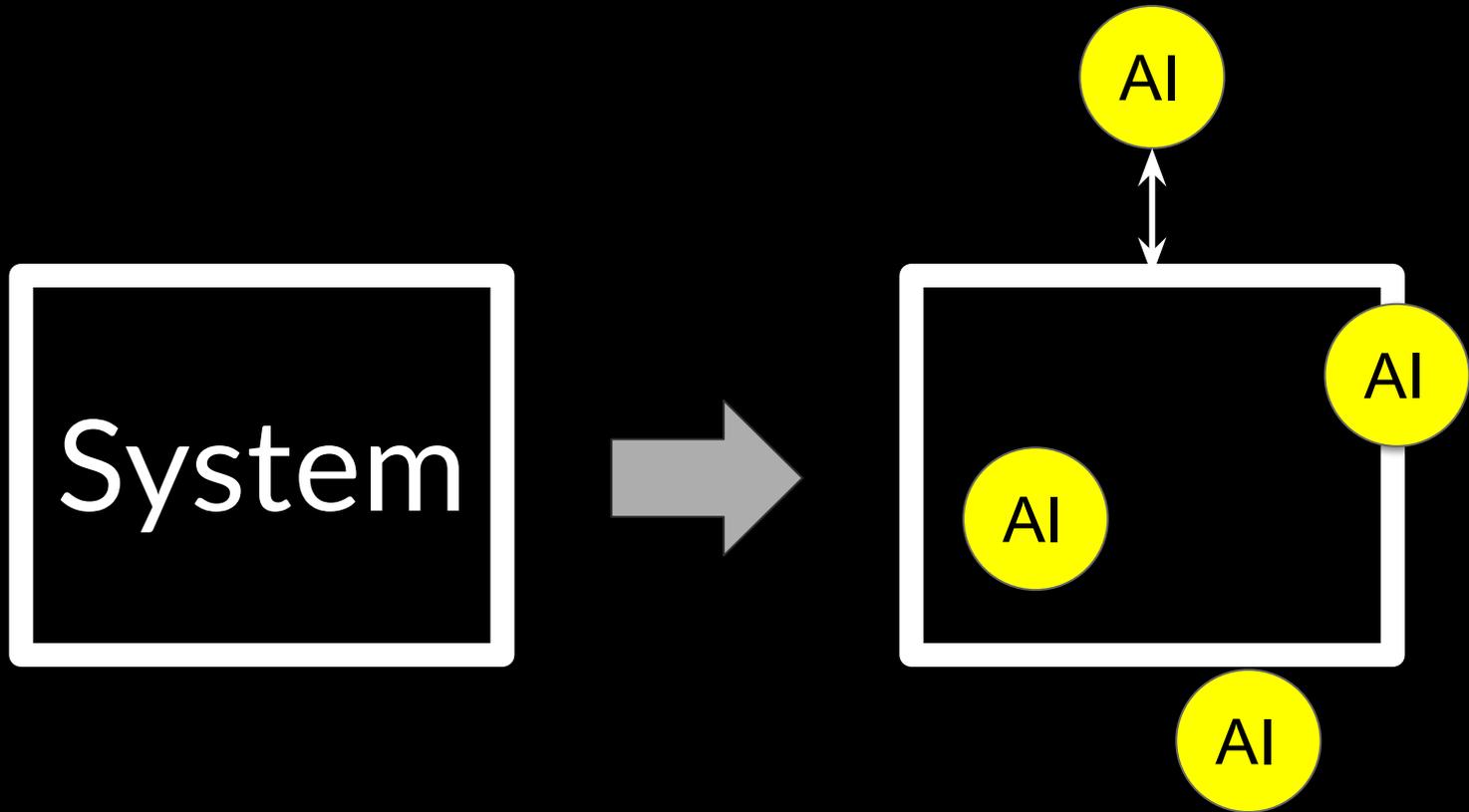
- Act
- Predict
- Learn
- Create
- Relate
- Master
- Evolve

Mariya Yao et al. (2018) Applied Artificial Intelligence

System



AI



“ Most **AI** we’re building
is nothing like human intelligence.

It’s just that we use machines to solve
different sub-problems for us. ”

— *Joanna Bryson*

Source: <https://blogs.thomsonreuters.com/answerson/recognizing-the-limitations-of-artificial-intelligence/>

“ **Algorithms** have a human component...
who gathers the data...
which design decisions are made,
how they are implemented,
how results are used to make decisions...”

— *Rachel Thomas*

Source: <https://www.fast.ai/2018/08/07/hbr-bias-algorithms/>

Human + AI

AI

Applied

Assisted

Augmented

Accelerated

Adapted

Actioned

Advanced

Source: @KirkDBone @ADBurciaga <https://twitter.com/KirkDBorne/status/1022930434378948608>

1. Interface
2. Data
3. Understanding
4. Decisions

#1 Interface

Conversational UI

MAY A.I. HELP YOU?

↳ INTELLIGENT CHATBOTS COULD
AUTOMATE AWAY NEARLY ALL OF
OUR COMMERCIAL INTERACTIONS
— FOR BETTER OR FOR WORSE.



↳ BY CLIVE THOMPSON

<https://www.nytimes.com/interactive/2018/11/14/magazine/tech-design-ai-chatbot.html>

Alexa's advice to 'kill your foster parents' fuels concern over Amazon Echo

Smart speaker's remarks, apparently quoted from Reddit, come as Amazon tries to boost speaker's conversational capacity



▲ Alexa develops its conversational skills through machine learning. Photograph: Mike Stewart/AP

Source: The Guardian <https://www.theguardian.com/technology/2018/dec/21/alexa-amazon-echo-kill-your-foster-parents>

Conversational UI Best Practices

1. Do not impersonate a human
2. Keep scope narrow & specific
3. Offer alternate channels

#2 Data

Collect, Clean, Classify

#3 Understanding

Analyze & Assist

#4 Decisions

Predict, Recommend

Wanted: The ‘perfect babysitter.’ Must pass AI scan for respect and attitude.



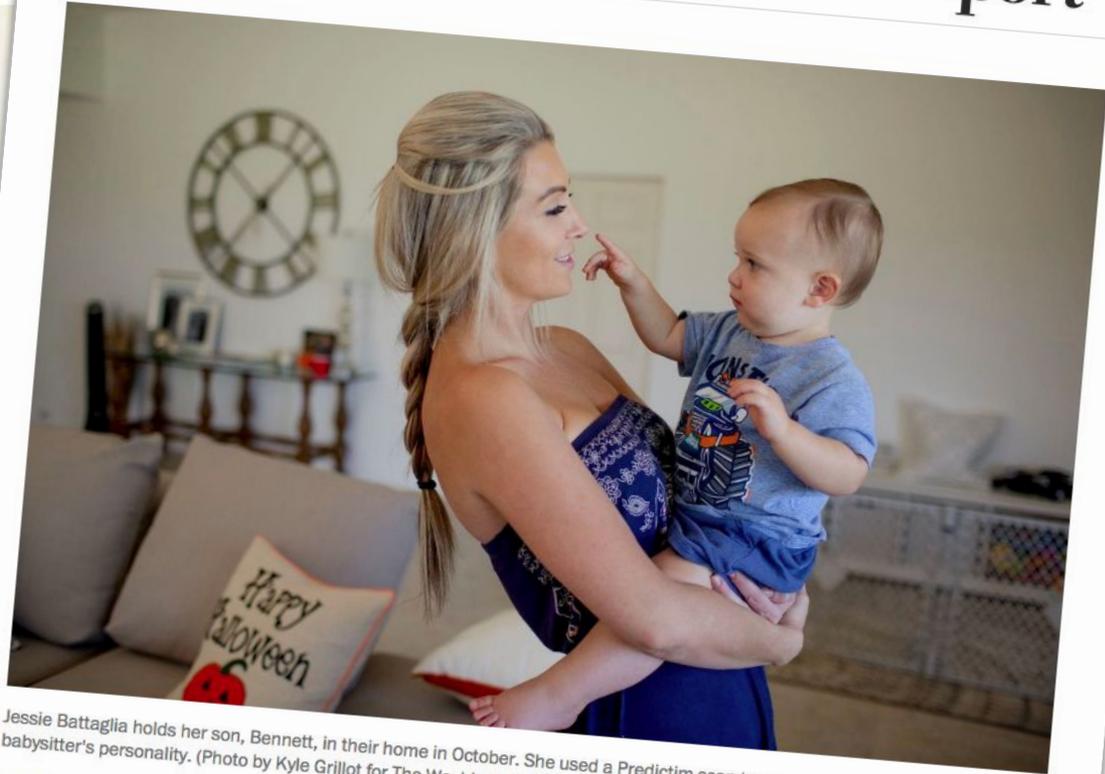
Jessie Battaglia holds her son, Bennett, in their home in Rancho Mirage, Calif. While screening for a new babysitter, Battaglia started using Predictim, an online service that claims to use “advanced artificial intelligence” to assess a sitter’s risk of drug abuse, bullying or having a “bad attitude.” (Kyle Grillot for The Washington Post)

By **Drew Harwell**
November 23, 2018

Source: [Washington Post](https://www.washingtonpost.com/local/parenting/wanted-the-perfect-babysitter-must-pass-ai-scan-for-respect-and-attitude/2018/11/23/)

Wanted
pass AI

AI start-up that scanned babysitters halts launch following Post report



Jessie Battaglia ho
Predictim, an onlin
"bad attitude." (Ky

Jessie Battaglia holds her son, Bennett, in their home in October. She used a Predictim scan to automatically analyze a babysitter's personality. (Photo by Kyle Grillot for The Washington Post)

By **Drew Harwell**
December 14, 2018

By **Drew Harwell**
November 23, 2018

Source: [Washington Post](https://www.washingtonpost.com)



EDITOR'S PICK | 27,357 views | Dec 17, 2018, 06:00am

This Health Startup Won Big Government Deals—But Inside, Doctors Flagged Problems

Source: [Forbes](#)

“...10% to 15% of the chatbot’s 100 most frequently suggested outcomes...either missed warning signs of a more serious condition...or were just flat-out wrong...

...broad concerns that the company has rushed to deploy software that has not been carefully vetted...”

<https://www.forbes.com/sites/parmyolson/2018/12/17/this-health-startup-won-big-government-dealsbut-inside-doctors-flagged-problems/>

“ [Machine Learning] models often don't model extreme corner cases very well, because data in those areas is rare.

Gathering data...is as important a skill as building fancy neural networks. ”

– *Reza Zadeh*

https://twitter.com/Reza_Zadeh/status/1053771110410375168

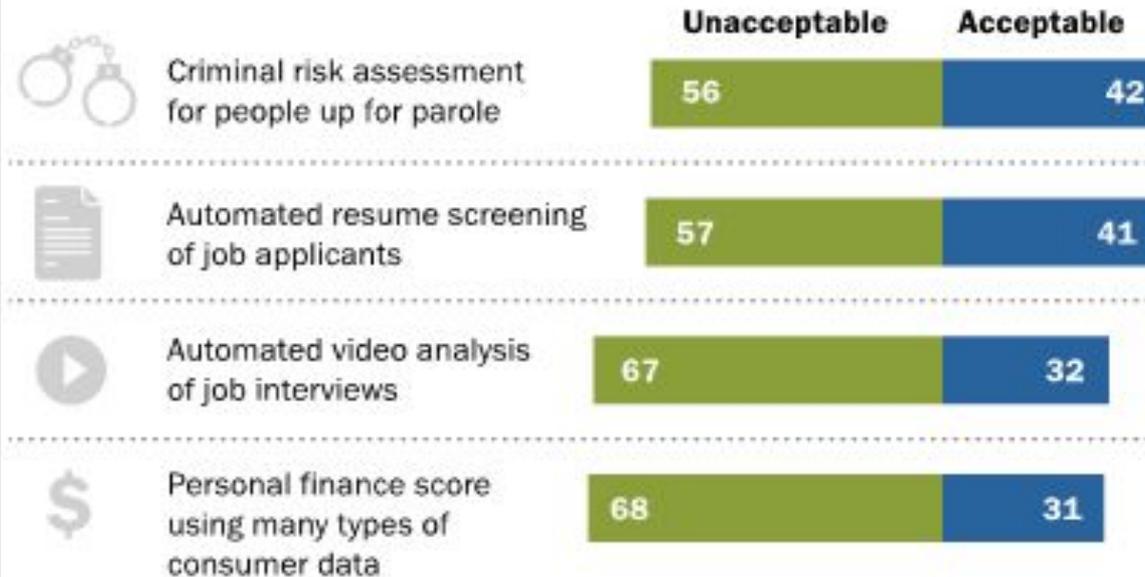
“ **Algorithms** written by humans — tackling harder and harder problems, but producing code embedded with bugs and biases — are troubling enough. More worrisome, perhaps, are the algorithms that are not written by humans, algorithms written by the machine, as it learns. ”

— *David Knuth*

<https://www.nytimes.com/2018/12/17/science/donald-knuth-computers-algorithms-programming.html>

Majorities of Americans find it unacceptable to use algorithms to make decisions with real-world consequences for humans

% of U.S. adults who say the following examples of algorithmic decision-making are ...



Note: Respondents who did not give an answer are not shown.

Source: Survey of U.S. adults conducted May 29-June 11, 2018.

"Public Attitudes Toward Computer Algorithms"

PEW RESEARCH CENTER

<http://www.pewinternet.org/2018/11/16/public-attitudes-toward-computer-algorithms/>

Governance

	Pharmaceuticals	Algorithms
Phase 1	<i>Safety:</i> Initial testing on human subjects	<i>Digital testing:</i> Performance on test cases
Phase 2	<i>Proof-of-concept:</i> Estimating efficacy and optimal use on selected subjects	<i>Laboratory testing:</i> Comparison with humans, user testing
Phase 3	<i>Randomised Controlled Trials:</i> Comparison against existing treatment in clinical setting	<i>Field testing:</i> Controlled trials of impact
Phase 4	<i>Post-marketing surveillance:</i> For long-term side-effects	<i>Routine use:</i> Monitoring for problems

Source: Stead et al, J Med Inform Assoc 1994 via David Spiegelhalter NeurIPS 2018
https://media.neurips.cc/Conferences/NIPS2018/Slides/Trustworthy_Algorithms.pdf

Ethics



NLADA - Dec 8, 2017



LSC Affinity Session - Jan 10, 2018



LSC Hackathon Group - Jan 9, 2018



SRLN Conference - Feb 23, 2018



SRLN 2018
Conference



EQUAL JUSTICE CONFERENCE

1. **Engage** our community and educate ourselves about new data-driven, algorithm-powered technology that is transforming our profession.
2. Discuss and identify the **impact** of new technology on due process and ethics.
3. Develop a set of community principles and guidelines to protect and promote our professional **values**.

Legal Services Community Principles and Guidelines for Due Process and Ethics in the Age of AI

Last Updated: June 5, 2018

Version 1.0

Link to this document <https://goo.gl/o9UFZC>



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About this initiative

These principles and guidelines are being developed for legal services...

Build natural and rich conversational experiences

Give users new ways to interact with your product by building engaging voice and text-based conversational interfaces, such as voice apps and chatbots, powered by AI. Connect with users on your website, mobile app, the Google Assistant, Amazon Alexa, Facebook Messenger, and other popular platforms and devices.

[Sign up for free](#)

Powered by Google's machine learning

Dialogflow incorporates Google's machine learning expertise and products such as Google Cloud Speech-to-Text.

Built on Google infrastructure

Dialogflow is backed by Google and runs on Google Cloud Platform, letting you scale to hundreds of millions of users.

Optimized for the Google Assistant

Dialogflow is the most widely used tool to build Actions for more than 400M+ Google Assistant devices.



Dialogflow is user-friendly, intuitive, and just makes sense. Its natural language processing (NLP) is the best we've tried.

<https://dialogflow.com>

“ There’s nothing artificial about **AI**.

It’s inspired by people,
it’s created by people,
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it impacts people. ”

— *Fei-Fei Li*

Source: <https://www.wired.com/story/fei-fei-li-artificial-intelligence-humanity/>

“ [AI] is a powerful tool we are only just beginning to understand, and that is a profound responsibility. ”

— *Fei-Fei Li*

Source: <https://www.wired.com/story/fei-fei-li-artificial-intelligence-humanity/>

@legalaidtech