

Machine Learning Meets Public Policy

Edward W. Felten

Kahn Professor of Computer Science and Public Affairs

Director, Center for Information Technology Policy

Princeton University





Elon Musk: We need to regulate AI before 'it's too late'

BY ALI BRELAND - 07/17/17 12:23 PM EDT

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Philosophically, intellectually—in every way—human society is unprepared for the rise of artificial intelligence.

HENRY A. KISSINGER JUNE 2018 ISSUE

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Should the Government Regulate Artificial Intelligence?

As AI makes more consequential decisions, should the government set limits? Three experts debate.

MR. CALO: One of the ironies of artificial intelligence is that proponents often make two contradictory claims. They say artificial intelligence is going to change everything, but there should be no changes to law or legal institutions in response. That doesn't make sense to me.

"AI is probably the most important thing humanity has ever worked on. I think of it as something more profound than electricity or fire."

Sundar Pichai, Google CEO
24 Jan 2018



People who are affected by AI/ML
deserve some say in how it is used.

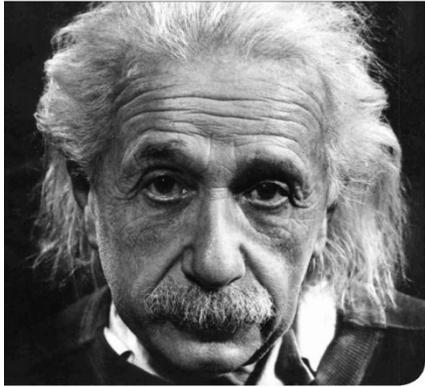
Decisions will be made.

What is our role in the decisions?

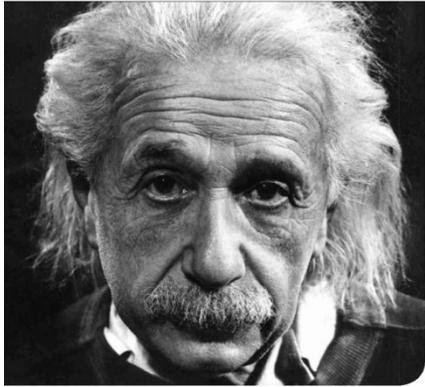




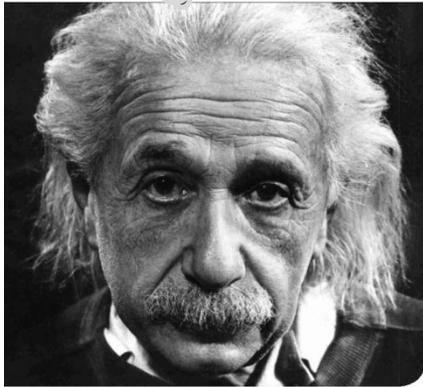




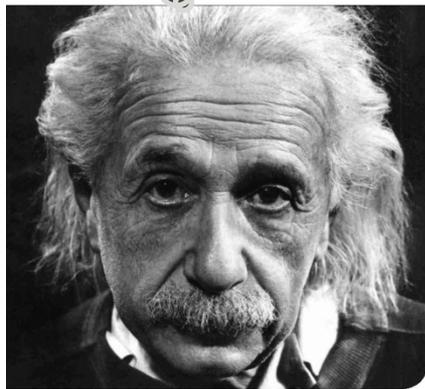




Truth



Truth





Politics is not a search for truth.

a feature, not a bug

Democracy is not a search for truth.

an algorithm for resolving disagreements

no question is undecidable

all questions are decidable in $O(1)$ time

no need to decide underlying facts

no need for a coherent explanation

and yet ...

individual legislators seem

individual legislators seem

logically inconsistent

individual legislators seem

logically inconsistent

indifferent to truth

Politicians behave that way for a reason.

Consider the following model ...



$P = \text{universe of proposals} = \{p_0, p_1, p_2, \dots\}$

Assume proposals are independent.

A bill is a subset of P .

Voter i has utility function $U_i(\cdot)$

Voter v_i supports proposal p_j iff $U_i(p_j) > 0$

Define: p_j passes iff
majority of voters support p_j

Assumption:

Given two disjoint bills B_1, B_2 :

$$U_i(B_1 \cup B_2) = U_i(B_1) + U_i(B_2)$$

Corollary:

Given two disjoint bills B_1, B_2 :

If V_i supports B_1 and V_i supports B_2 ,

Then V_i supports $B_1 \cup B_2$

Theorem:

Given two disjoint bills B_1 , B_2 :

If B_1 passes and B_2 passes,

Then $B_1 \cup B_2$ passes

Non-Theorem:

Given two disjoint bills B_1 , B_2 :

If B_1 passes and B_2 passes,

Then $B_1 \cup B_2$ passes

Voter	B_1	B_2	$B_1 \cup B_2$
Alice	1	-2	-1
Bob	-2	1	-1
Charlie	1	1	2

outputs not logically consistent

Let's generalize the model ...



partition voters into districts

partition voters into districts

legislature: one rep per district

partition voters into districts

legislature: one rep per district

rep supports B iff

majority of constituents support B

implications

legislator not logically consistent

legislator not logically consistent

supports B_1 , supports B_2

legislator not logically consistent

supports B_1 , supports B_2

might not support $B_1 \cup B_2$

legislator doesn't care about the facts

individual legislators seem

logically inconsistent

indifferent to truth

legislative strategy

Consider the following problem...



Amendment Problem

Given:

bill B

amendments A_1, \dots, A_n

(mutually disjoint)

*Can you add a subset of the A_i to B,
to make an amended proposal that will pass?*

Amendment Problem

Given:

bill B

amendments A_1, \dots, A_n

(mutually disjoint)

NP-complete!

*Can you add a subset of the A_i to B,
to make an amended proposal that will pass?*

Nobody knew this could be
so complicated.



real world: even more complicated

voters not self-consistent

legislators make deals

administrative agencies

indirectly accountable to voters

locally, system will look irrational

It's complicated.

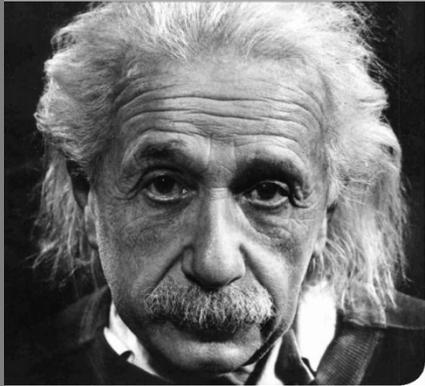
what to do?

“It’s not okay to not know how the Internet works.”

“It’s not okay to not know how government works.”

good decisions







just the facts

SOUP	NOODLE SOUP	SOUP	SOUP
Chicken Noodle	Chicken Noodle	Chicken Noodle	Chicken Noodle
...



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...	...

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...	...

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...	...

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1 Chicken Noodle	5.99
1 Beef Noodle	5.99
...	...

NOODLE/RICE NOODLES SOUP	
1 Chicken Noodle	5.99
1 Beef Noodle	5.99
...	...

RICE PLATE	
1 Chicken Plate	6.99
1 Beef Plate	6.99
...	...

SOUP	
1 Chicken Noodle	5.99
1 Beef Noodle	5.99
...	...

SOUP	
1 Chicken Noodle	5.99
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...	...

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SOUP	SOUP	SOUP
Chicken Noodle	5.99	...
...

SOUP	SOUP	SOUP
Chicken Noodle	5.99	...
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SOUP	SOUP	SOUP
Chicken Noodle	5.99	...
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Chicken Noodle	5.99	...
...

SOUP	NOODLE SOUP	MEAT	CHICKEN	VEGETARIAN	DESSERTS
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...

Salute Kosher Restaurant

63-62 136 Street, Forest Hills, NY 11375
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...

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...	...

EXPRESS LUNCH	APPETIZERS
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1 Turkey Sandwich	1 Chicken Wings
...	...

ENTRIES	NOODLE/RICE NOODLES
Roast Beef	Chicken Noodle Soup
...	...

SANDWICHES	DESSERTS
1 Chicken Sandwich	1 Apple Pie
1 Turkey Sandwich	1 Apple Pie
...	...

DESSERTS
1 Apple Pie
1 Chocolate Cake
...

SOUP	DESSERTS
Chicken Noodle Soup	1 Apple Pie
...	...

ENTRIES	DESSERTS
Roast Beef	1 Apple Pie
...	...

ENTRIES	DESSERTS
Roast Beef	1 Apple Pie
...	...

EXPRESS BREAKFAST	EXPRESS AVAILABLE 24/7
1 Omelette	1 Bakery Shale Pastry
1 Fruit or Cheese	1 Bakery Shale Pastry
...	...

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dictate the decision



Who elected you?

download your brain

be useful

your knowledge

+

their preferences

your knowledge

+

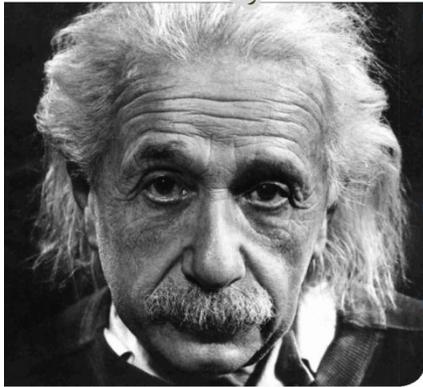
their knowledge and preferences

get their knowledge and preferences

structure the decision space

Knowledge

Knowledge
Preferences



engagement over time

mutual trust

role of our community

need boots on the ground

create a career path

build incentives

This is important!

We need to be in the room.

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