O ESTADO DEMOCRÁTICO DIANTE DO APRENDIZADO DE MÁQUINA E DEMAIS SISTEMAS ALGORÍTMICOS

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professor da UFABC

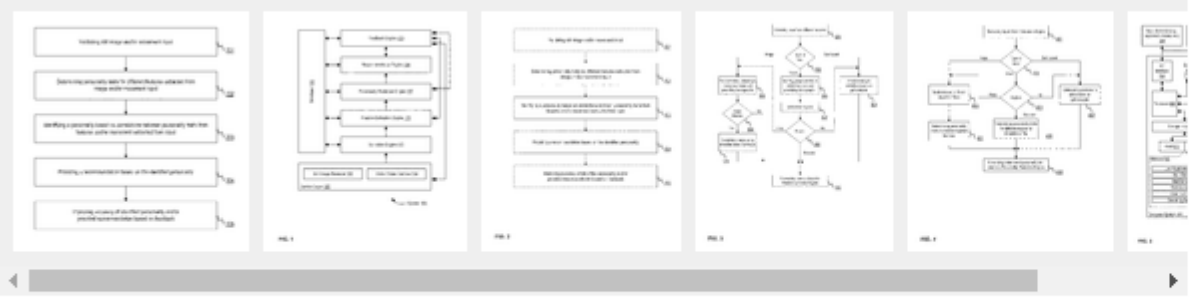
COMO A **DEMOCRACIA** É AFETADA PELO **MACHINE LEARNING** E PELA **INTELIGÊNCIA ARTIFICIAL**?

System and method for determining the characteristics of human personality and providing real-time recommendations

Abstract

The present disclosure relates to systems, methods, and non-transitory computer-readable media for identifying a personality of a human subject based on correlations between personality traits obtained from the subject's physical features, which may include a movement pattern of the subject, such as the subject's gait. Embodiments in accordance with the present disclosure are further capable of providing a recommendation to the subject for a product or service based on the identified personality of the subject.

Images (6)



Classifications

G06K9/00362 Recognising human body or animal bodies, e.g. vehicle occupant, pedestrian;

US9449221B2

United States

Download PDF | Find Prior Art | Similar

Inventor: Abhishek GUNJAN

Current Assignee : Wipro Ltd

Worldwide applications

2014 • US

Application US14/273,121 events

2014-03-25 • Priority to IN1573CH2014

2014-03-25 • Priority to IN1573/CHE/2014

2014-05-08 • Application filed by Wipro Ltd

2014-05-08 • Assigned to WIPRO LIMITED

2015-10-01 • Publication of US20150278590A1

Abstract

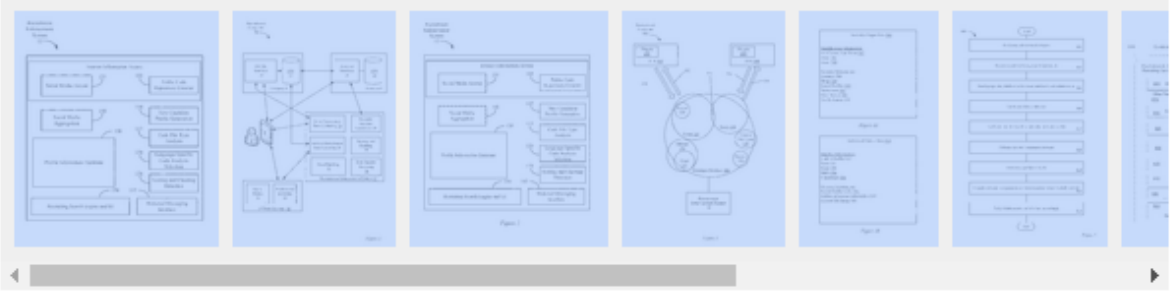
A presente divulgação refere-se a sistemas, métodos e meios não transitórios legíveis por computador para **identificar uma personalidade de um sujeito humano com base em correlações entre traços de personalidade obtidos a partir das características físicas do sujeito**, que podem incluir um padrão de movimento do sujeito, tal como a marcha do sujeito. A aplicação é ainda **capaz de fornecer uma recomendação** ao sujeito para um produto ou serviço **com base na personalidade identificada**.

Method, apparatus and computer program product to generate psychological, emotional, and personality information for electronic job recruiting

Abstract

A recruitment enhancement system is disclosed that can be used by job recruiters to assess a job applicant's suitability for particular jobs. The recruitment enhancement system can maintain and regularly update a proprietary database of individuals where the individuals can be scored or ranked within a profession. Additionally, the recruitment enhancement system can be configured to generate information on the psychological, emotional or personality attributes of an individual based on online content authored by the individual as an additional form of information to determine an optimum time to recruit an individual and the personality fit of an individual to a job opening.

Images (10)



Classifications

G06Q10/1053 Employment or hiring

US20130290207A1

United States

Download PDF | Find Prior Art | Similar

Inventor: Luca Bonmassar

Current Assignee : ACIST Medical Systems Inc , KCG IP HOLDINGS LLC

Worldwide applications

2012 • US

Application US13/652,749 events

2012-04-30 • Priority to US201261640656P

2012-10-16 • Application filed by GILD Inc

2013-10-31 • Publication of US20130290207A1

2019-04-20 • Application status is Abandoned

Show all events

… sistema de computador inclui um processador e uma memória e **adquire conteúdo de mídia social criado por um indivíduo.** O conteúdo é **classificado usando Aprendizado de Máquina (ML)** de acordo com pelo menos um fator indicativo de **características psicológicas, emocionais ou de personalidade do indivíduo** relevantes para o recrutamento do indivíduo para um trabalho...

Personality characteristic forecasting method based on voices

Abstract

The invention discloses a personality characteristic forecasting method based on voices. The method includes the following implementation steps that personality evaluation and determination are carried out on multiple reference determination persons to obtain multiterm personality characteristic factor evaluated values; voice fragments of the determination persons are collected, multiterm acoustics prosodic characteristics are extracted, and multiterm statistical characteristic values are extracted; a voice personality forecasting machine learning model is built, the multiterm personality characteristic factor evaluated values of all the reference determination persons and the multiterm statistical characteristic values are respectively input into the voice personality forecasting machine learning model for training; the voice fragments of a determination person are collected, acoustics prosodic characteristics and statistical characteristics are extracted and input into the voice personality forecasting machine learning model to obtain the multiterm personality characteristic factor evaluated values corresponding to all terms of acoustics prosodic characteristics, and all the personality characteristic factor evaluated values of all the characteristics are weighted and summed to obtain and output the multiterm personality characteristic factor evaluated value of the determination person. The personality characteristic forecasting method has the advantages of being rapid in forecasting process and objective and accurate in effect, and forecasting material is easy and convenient to collect.

CN103440864A

China

Other languages: Chinese

Inventor: 赵欢, 张希翔, 陈佐, 郑睿

Worldwide applications

2013 • ~~CN~~

Application CN2013103292952A events

2013-07-31 • Application filed by 湖南大学

2013-07-31 • Priority to CN2013103292952A

2013-12-11 • Publication of CN103440864A

Abstract

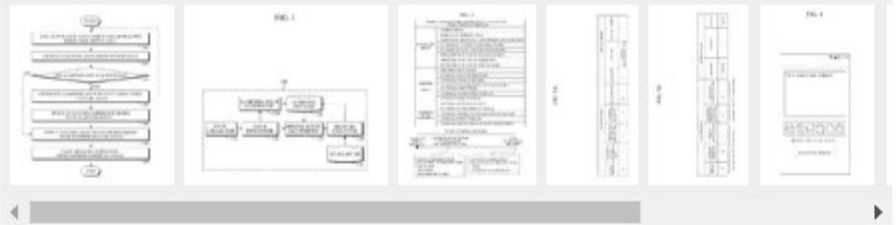
A invenção divulga um método de previsão de características de personalidade baseado em vozes. O método inclui as seguintes etapas de implementação de **avaliação e determinação da personalidade** realizadas em várias pessoas para a determinação de referência com a finalidade de obter valores sobre múltiplos termos característicos do fator de personalidade avaliada; **fragmentos de voz das pessoas** são coletados, características prosódicas acústicas são extraídas, valores característicos estatísticos são extraídos; um **modelo de aprendizagem por máquina de previsão de personalidade de voz é construído ...**

Apparatus and method for determining user's mental state

Abstract

An apparatus for determining a user's mental state in a terminal is provided. The apparatus includes a data collector configured to collect sensor data; a data processor configured to extract feature data from the sensor data; and a mental state determiner configured to provide the feature data to an inference model to determine the user's mental state.

Images (8)



Classifications

G PHYSICS
G06 COMPUTING; CALCULATING; COUNTING
G06N COMPUTER SYSTEMS BASED ON SPECIFIC COMPUTATIONAL MODELS
G06N5/00 Computer systems using knowledge-based models
G06N5/02 Knowledge representation

View 6 more classifications

US9928462B2
United States

Download PDF Find Prior Art Similar

Inventor: Ho-sub Lee

Current Assignee : Samsung Electronics Co Ltd

Worldwide applications

2012 • KR 2013 • EP US JP CN 2018 • US JP

Application US14/075,391 events

2012-11-09 • Priority to KR10-2012-0126804
2012-11-09 • Priority to KR1020120126804A
2013-11-08 • Application filed by Samsung Electronics Co Ltd
2013-11-08 • Assigned to SAMSUNG ELECTRONICS CO., LTD.
2014-05-15 • Publication of US20140136450A1
2018-03-27 • Application granted
2018-03-27 • Publication of US9928462B2
2019-04-02 • Application status is Active
2035-04-07 • Adjusted expiration

Patente registrada
US9928462b2

Apparatus and method for determining user's mental state.

"Aparelho e método para determinar o estado mental do usuário".

“Um aparelho para determinar
o estado mental de um usuário em um terminal
é fornecido. O aparelho inclui um coletor de dados
configurado para coletar dados do sensor; um processador
de dados configurado para extrair dados de recursos do
sensor; e um determinador de estado mental configurado
para fornecer os dados do recurso a um modelo de inferência
para determinar o estado mental do usuário.”

“(…) o estado mental pode incluir uma ou mais emoções, um sentimento e um estresse, cada um dos quais pode ser classificado em vários níveis inferiores. Por exemplo, emoção pode ser classificada em felicidade, prazer, tristeza, medo, etc.; sentimento pode ser classificado em bom, normal, deprimente, etc.; e o estresse pode ser classificado em alto, médio e baixo.”

Mas como é possível identificar
tais sensações e sentimentos?

A patente nos dá uma indicação:

“(...) quando a **velocidade de digitação** usando um teclado é de **23 caracteres por minuto**, a frequência de **uso da tecla de retrocesso é três vezes ao escrever** uma mensagem, a frequência de uso de um sinal especial é cinco vezes, **o número de tremores de um dispositivo é 10**, uma iluminância média é de 150 Lux, e um valor numérico de uma localização específica (por exemplo, estrada) é 3, um estado de emoção classificado aplicando os dados do recurso ao **modelo de inferência é “susto”**, com um **nível de confiança de 74%**.”

A economia informacional está se tornando uma **economia baseada em dados,** em uma coleta ativa e pervasiva de dados para alimentar uma série de plataformas.


aliança


2010-08-18
CLOCK


1 2 3
4 5 6
7 8 9
* 0
SAMSUNG

RECEITA (2016)

Apple	US$	215.64 bi
Amazon	US$	135.99 bi
Google	US$	90.23 bi
Facebook	US$	27.64 bi

(US$ 469,5 bi)

PIB BRASIL 2016 US$ 1,794 tri

COMO A **DEMOCRACIA** PODE SE MANTER QUANDO O **ESTADO** COMEÇA A UTILIZAR ALGORITMOS DE INTELIGÊNCIA DE MÁQUINA (machine learning, deep learning) **OPACOS, SEM TRANSPARÊNCIA**?

ALGORITMOS DESENVOLVIDOS POR EMPRESAS PRIVADAS SÃO FECHADOS

1- SEGREDO DE NEGÓCIOS
2- PROPRIEDADE INTELECTUAL
3- PROTEGER SUA OPERAÇÃO

(baseado em Frank Pasquale)

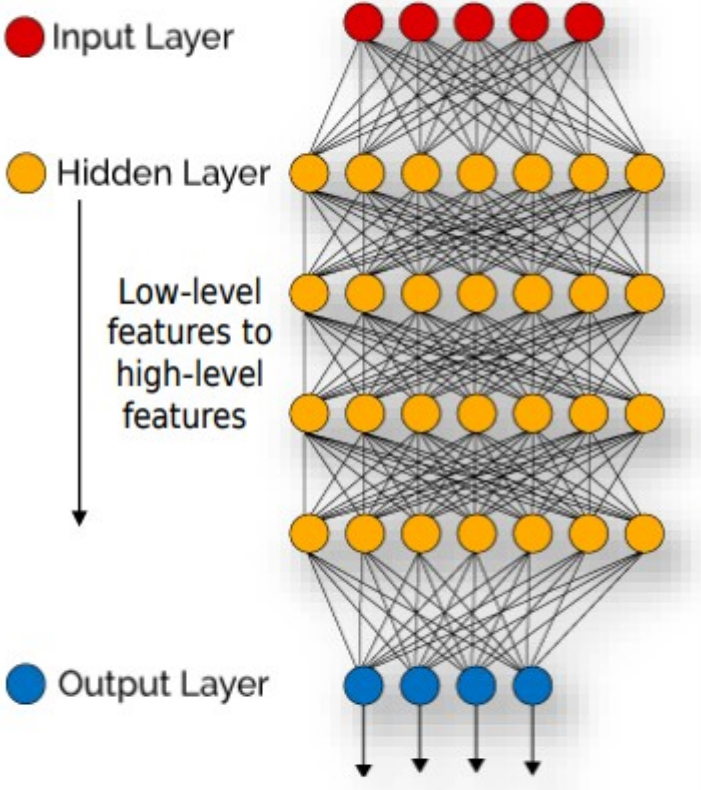
ALGORITMOS DE **DEEP LEARNING,**
ALGORITMOS **GENÉTICOS, ENTRE OUTROS**
SÃO APRESENTADOS COMO:

IMPERSCRUTÁVEIS

INDESLINDÁVEIS

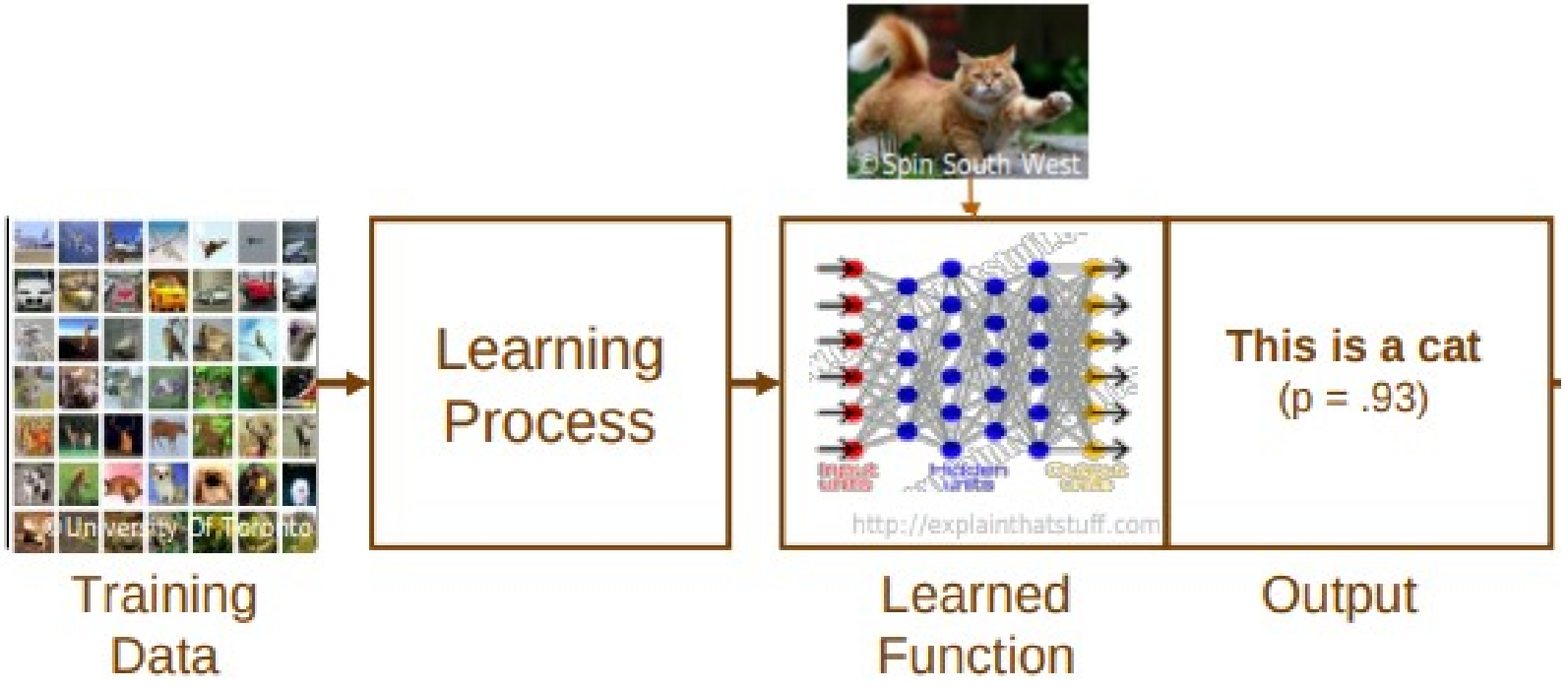
INSONDÁVEIS

Deep Learning Neural Network



Automatic algorithm
(feature extraction and classification)

https://www.xenonstack.com/
XenonStack ©


Learning
Process
This is a cat
(p = .93)
http://explainthatstuff.com
Training
Data
Learned
Function
Output

… ALGORITMOS OPACOS
E SISTEMAS FECHADOS

CASO DO SOFTWARE **COMPAS**
NO JUDICIÁRIO NORTE-AMERICANO

Sistema de algoritmo que determina pena de condenados cria polêmica nos EUA

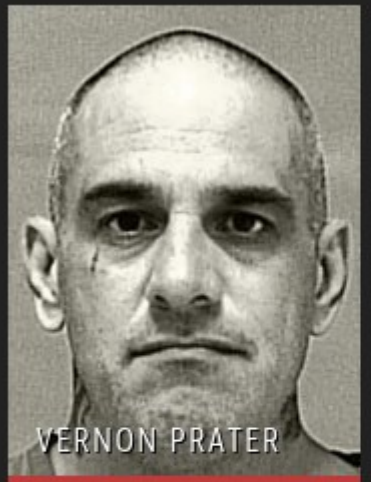
Simon Maybin
BBC News

31 outubro 2016

Algoritmo matemático ajuda a calcular penas nos EUA

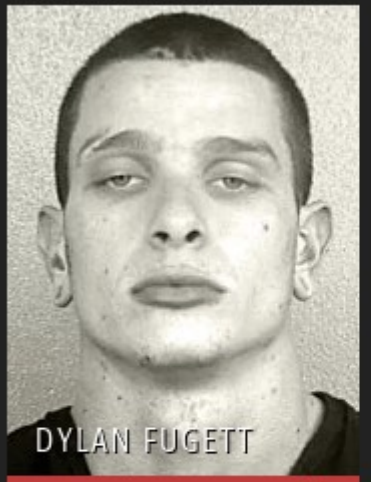
FONTE https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing

Two Petty Theft Arrests



Borden was rated high risk for future crime after she and a friend took a kid's bike and scooter that were sitting outside. She did not reoffend.

Two Drug Possession Arrests



Fugett was rated low risk after being arrested with cocaine and marijuana. He was arrested three times on drug charges after that.

Prediction Fails Differently for Black Defendants

	WHITE	AFRICAN AMERICAN
Labeled Higher Risk, But Didn't Re-Offend	23.5%	44.9%
Labeled Lower Risk, Yet Did Re-Offend	47.7%	28.0%

TARLETON GILLESPIE:

ALGORITMOS SÃO APRESENTADOS COMO ACIMA DE CONTROVÉRSIAS POR SUA SUPOSTA EXATIDÃO E NEUTRALIDADE

ALGORITMOS DE **DEEP LEARNING,**
ENTRE OUTROS ALGORITMOS DE IA são
baseados em probabilidades.

Inferências realizadas a partir de um percentual da
população são tomadas como verdade para toda a população.

Temas conflitivos do debate sobre algoritmos e **responsabilidade** em várias dimensões éticas importantes:

Justiça e viés;
Opacidade e transparência;
Compartilhamento e reaproveitamento de dados;
Falta de padrões para auditoria;
Regulação e risco;
Confiança e responsabilidade.

OPEN LETTER TO THE EUROPEAN COMMISSION ARTIFICIAL INTELLIGENCE AND ROBOTICS

Sign the letter

We, Artificial Intelligence and Robotics Experts, industry leaders, law, medical and ethics experts, confirm that establishing EU-wide rules for Robotics and Artificial Intelligence is pertinent to guarantee a **high level of safety and security to the European Union citizens** while fostering **innovation**.

As human-robot interactions become common place, the European Union needs to offer the appropriate framework to **reinforce Democracy and European Union values**. In fact, the Artificial Intelligence and Robotics framework must be explored not only through economic and legal aspects, but also through its societal, psychological and ethical impacts. In this context, we are **concerned** by the European Parliament Resolution on **Civil Law Rules of Robotics**, and its recommendation to the European Commission in its paragraph 59 f):

> "Creating a specific **legal status for robots** in the

2. The creation of a **Legal Status** of an "electronic person" for "autonomous", "unpredictable" and "self-learning" robots is justified by the incorrect affirmation that damage liability would be impossible to prove.

From a technical perspective, this statement offers many bias based on an overvaluation of the actual capabilities of even the most advanced robots, a superficial understanding of unpredictability and self-learning capacities and, a robot perception distorted by Science-Fiction and a few recent sensational press announcements.

From an **ethical** and **legal** perspective, creating a legal personality for a robot is inappropriate whatever the legal status model:

a. A legal status for a robot can't derive from the **Natural**

WHO ARE WE ?

We are Political Leaders, AI/robotics researchers and industry leaders, Physical and Mental Health specialists, Law and Ethics experts gathered to voice our concern about the negative consequences of a legal status approach for robots in the European Union.

Fostering an actionable framework for civil law rules on robotics and AI consequently addressing the issue of liability of "autonomous" robots is our goal. However, we believe that creating a legal status of electronic "person" would be ideological and non-sensical and non-pragmatic.

The European Economic and Social Committee clearly stated in its opinion "The consequences of Artificial Intelligence on the (digital) single market, production, consumption, employment and society" §3.33 that they were opposed to any form of legal status for robots or AI.

Similarly, UNESCO's COMEST * report on Robotics Ethics of 2017, share a similar point of view : in the article 201 where they find "highly counterintuitive to call them 'persons' as long as they do not possess some additional qualities typically associated with human persons, such as freedom of will, intentionality, self-consciousness, moral agency or a sense of personal identity. It should be mentioned in this context, however, that the Committee on Legal Affairs of the European Parliament, in its 2016 Draft Report with recommendations to the Commission on Civil Law Rules on Robotics, already considers the possibility of "creating a specific legal status for robots, so that at least the most sophisticated autonomous robots could be established as having the status of electronic persons with specific rights and obligations, including that of making good any damage they may cause, and applying electronic personality to cases where robots make smart autonomous decisions or otherwise interact with third parties independently" (JURI, 2016, section 59.f).

Para um desenvolvimento
democrático e socialmente responsável do ML e da IA
do mesmo modo que incorporamos métodos de
segurança devemos incorporar **procedimentos**
de garantia de direitos humanos.

Incorporar elementos de segurança,
Responsabilidade, privacidade, justiça
e não-discriminação na **concepção do projeto.**

Responsabilidade

Criar meios de reparação visíveis para efeitos individuais ou sociais adversos de um sistema de decisão algorítmica. Todo projeto deve ter uma pessoa responsável pelo tratamento tais questões.

A responsabilidade deve ser pensada nas fases de
1) design ou criação; 2) pré-lançamento e teste;
3) pós-lançamento; 4) avaliações posteriores frequentes.

Adaptado do texto: Principles for Accountable Algorithms and a Social Impact Statement for Algorithms

Explicabilidade

Assegurar de que as decisões algorítmicas, bem como quaisquer dados que conduzam essas decisões, possam ser explicadas aos usuários finais e outras partes interessadas em termos não técnicos.

Adaptado do texto: Principles for Accountable Algorithms and a Social Impact Statement for Algorithms

Precisão

Identificar, registrar e articular fontes de erro, vieses e incerteza na operação algorítmica e suas fontes de dados, de modo a criar e informar os procedimentos de mitigação.

Adaptado do texto: Principles for Accountable Algorithms and a Social Impact Statement for Algorithms

Auditabilidade

Assegurar que organizações da sociedade civil
e universidades, além das autoridades competentes
pesquisem, compreendam e revisem o comportamento do algoritmo de relevância pública.

Garantir a documentação detalhada, códigos abertos,
APIs tecnicamente adequadas e termos de uso.

Adaptado do texto: Principles for Accountable Algorithms and a Social Impact Statement for Algorithms

Justiça

Certificar de que as decisões algorítmicas não criem impactos discriminatórios ou injustos ao comparar dados e realizar prescrições e predições.

Adaptado do texto: Principles for Accountable Algorithms and a Social Impact Statement for Algorithms

Incentivo à Pesquisa

Garantir que iniciativas de análise, experimentos e desenvolvimento de possibilidades de regulação e governança das soluções de Machine Learning e IA, bem como, sobre seus efeitos e implicações no mundo do trabalho e da cultura.

Explainable Artificial Intelligence (XAI)

Mr. David Gunning

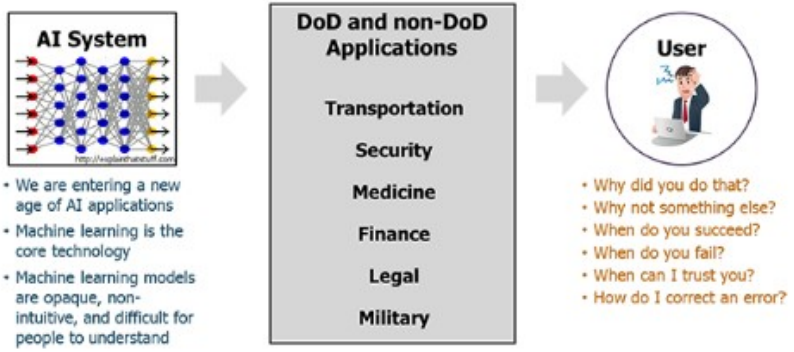


Figure 1. The Need for Explainable AI

Dramatic success in machine learning has led to a torrent of Artificial Intelligence (AI) applications. Continued advances promise to produce autonomous systems that will perceive, learn, decide, and act on their own. However, the effectiveness of these systems is limited by the machine's current inability to explain their decisions and actions to human users (Figure 1). The Department of Defense (DoD) is facing challenges that demand more intelligent, autonomous, and symbiotic systems. Explainable AI—especially explainable machine learning—will be essential if future warfighters are to understand, appropriately trust, and effectively manage an emerging generation of artificially intelligent machine partners.

RESOURCES

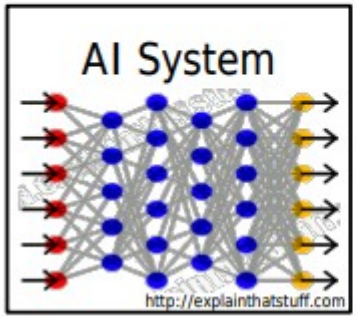
DARPA-BAA-16-53

DARPA-BAA-16-53: Proposers Day Slides

XAI Program Update

The Need for Explainable AI

XAI
EXPLAINABLE ARTIFICIAL INTELLIGENCE



- We are entering a new age of AI applications
- Machine learning is the core technology
- Machine learning models are opaque, non-intuitive, and difficult for people to understand

- Why did you do that?
- Why not something else?
- When do you succeed?
- When do you fail?
- When can I trust you?
- How do I correct an error?

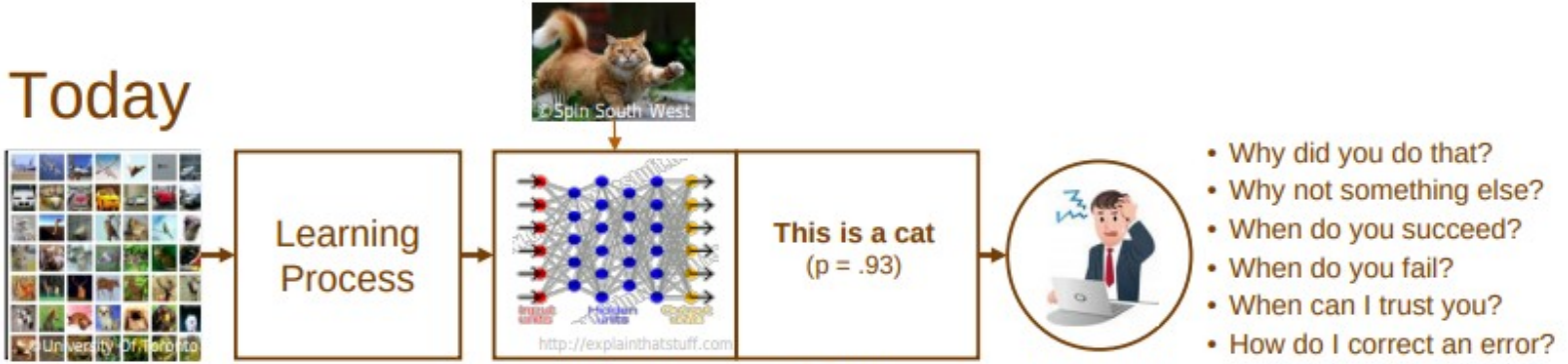
- The current generation of AI systems offer tremendous benefits, but their effectiveness will be limited by the machine's inability to explain its decisions and actions to users

What Are We Trying To Do?

DARPA

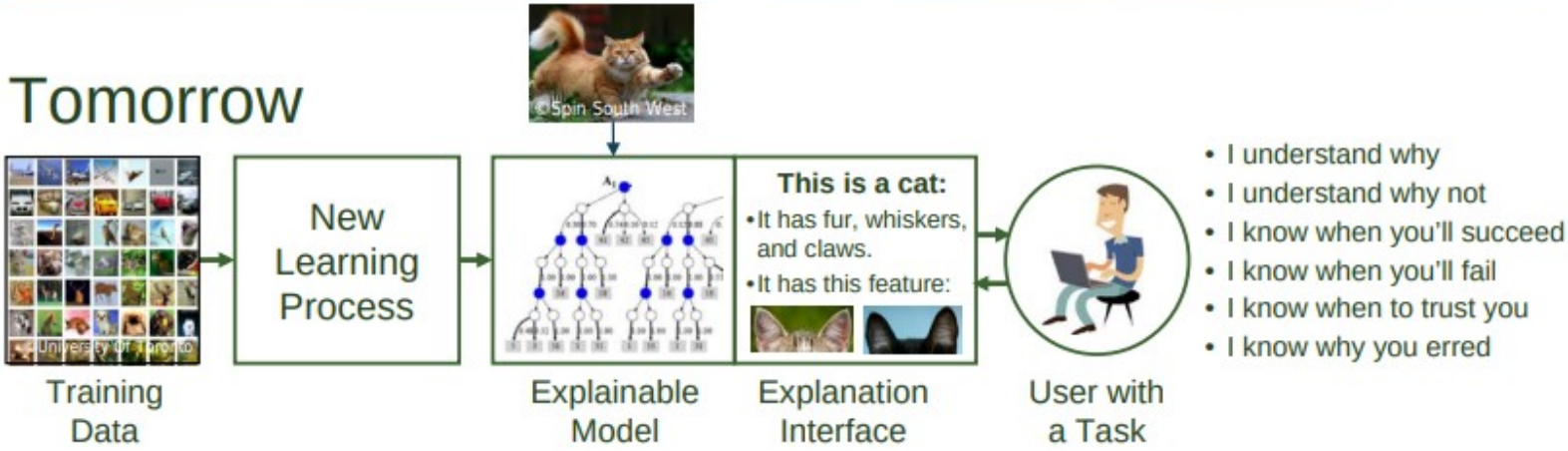
XAI
EXPLAINABLE ARTIFICIAL INTELLIGENCE

Today



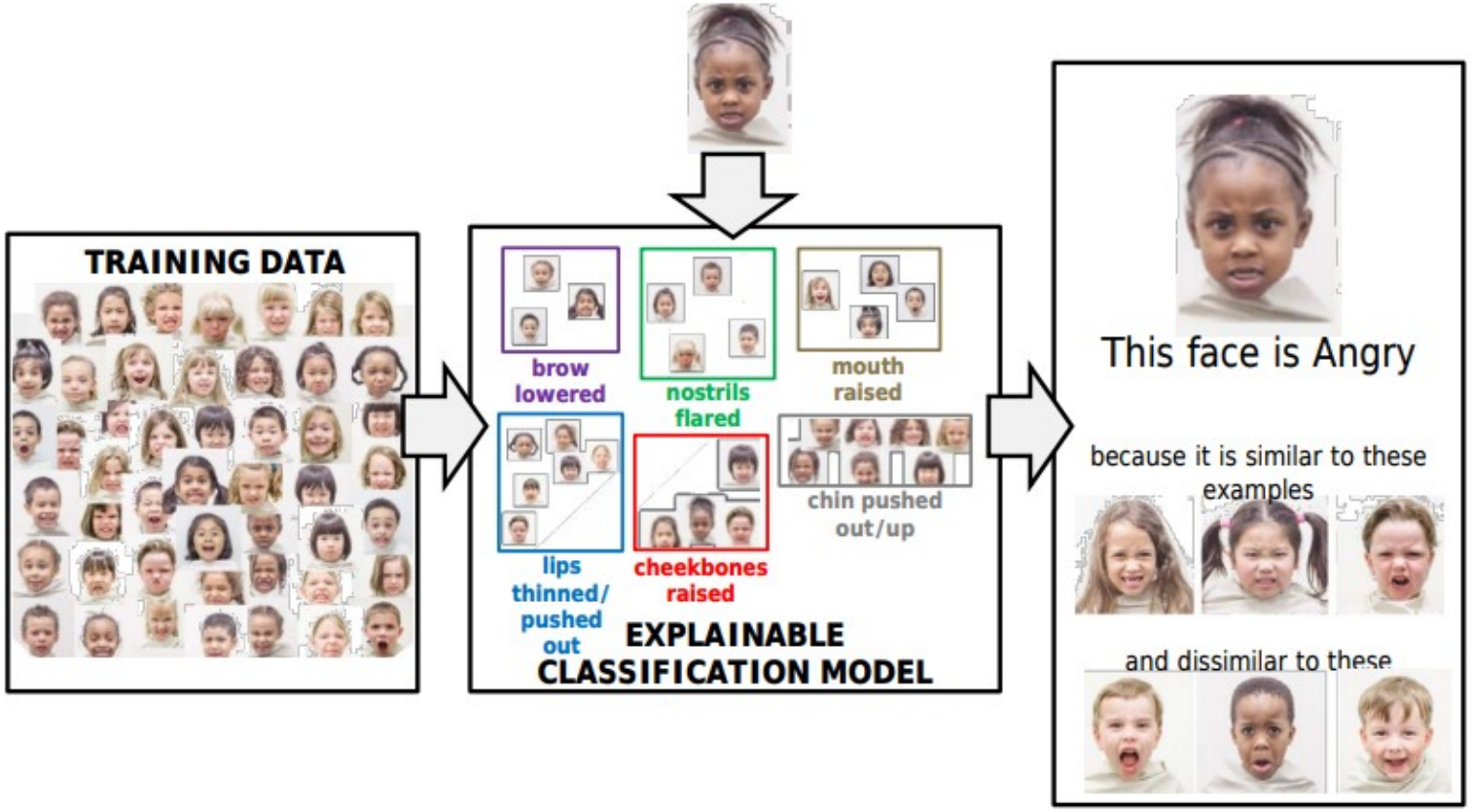
- Why did you do that?
- Why not something else?
- When do you succeed?
- When do you fail?
- When can I trust you?
- How do I correct an error?

Tomorrow



- I understand why
- I understand why not
- I know when you'll succeed
- I know when you'll fail
- I know when to trust you
- I know why you erred

Explanation by Selection of Teaching Examples (Rutgers)



BAYESIAN TEACHING for optimal selection of examples for machine explanation

CÉDRIC VILLANI

Mathematician and
Member of the French Parliament

FOR A MEANINGFUL ARTIFICIAL INTELLIGENCE

TOWARDS A FRENCH AND EUROPEAN STRATEGY

Composition of the mission

Marc Schoenauer Principal Senior Researcher with INRIA • **Yann Bonnet** General secretary to the French Digital Council • **Charly Berthet** Head of legal and institutional affairs at the French Digital Council • **Anne-Charlotte Comut** Rapporteur of the French Digital Council • **François Levin** Head of economic and social affairs at the French Digital Council • **Bertrand Rondepierre** Engineer for the French defense procurement agency

Because of this, collectively addressing this issue is in the general interest; France and Europe need to ensure that their voices are heard and must do their utmost to remain independent. But there is a lot of competition: The United States and China are at the forefront of this technology and their investments far exceed those made in Europe. Canada, the United Kingdom and, especially, Israel hold key positions in this emerging ecosystem. Considering that France and Europe can already be regarded as "cybercolonies"[2] in many aspects, it is essential that they resist all forms of determinism by proposing a coordinated response at European level.

Obrigado!

Sergio Amadeu da Silveira

UFABC – Universidade Federal do ABC
Centro de Engenharia, Modelagem e Ciências Sociais Aplicadas

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