



# HORSE 2017

## *On “Horses” in Applied Machine Learning*



Queen Mary  
University of London

centre for digital music

# FIRE SAFETY



Queen Mary  
University of London

centre for digital music

# WELCOME

- \* 2<sup>nd</sup> Edition!
  - \* <http://c4dm.eecs.qmul.ac.uk/horse2016>
- \* Organised by the Machine Listening Lab  
<http://machine-listening.eecs.qmul.ac.uk/>
- \* Acknowledgments to
  - \* AHRC project DaCaRyH AH/N504531/1
  - \* AHRC FoF AH/R004706/1
  - \* RAEng Research Fellowship RF/128
  - \* EPSRC Research Fellowship EP/L020505/1

# What is a “horse”?

“A ‘horse’ is just a system that is not actually addressing the problem it appears to be solving.”

Sturm, “A simple method to determine if a music information retrieval system is a ‘horse’,” *IEEE Transactions Multimedia* 16(6): 1636–1644, 2014.

*Is a system giving  
right answers for wrong reasons?*



Queen Mary  
University of London

centre for digital music

# SCHEDULE, part 1

| Time  | Speaker         | Title  |
|-------|-----------------|--|
| 9h00  | Coffee          |  |
| 9h45  | Welcome         |  |
| 10h00 | Dan Stowell     | <i>Reducing confounding factors in automatic acoustic recognition of individual birds</i>              |
| 10h30 | Yann Bayle      | <i>Preventing "Horses" in Music Information Retrieval tasks</i>  |
| 11h00 | Erica Thompson  | <i>On Hawkmoths and Horses: Epistemic issues in modelling complex systems</i>                          |
| 11h30 | Saumitra Mishra | <i>Opening the black box: On the interpretability of machine learning models for machine listening</i> |
| 12h00 | Lunch           |  |



# SCHEDULE, part 2

|       |  |  |
|-------|--|--|
| 13h00 | David J. Hand  | <i>Keynote: But that's not how I see it: “horse” constructs and what we want to know</i> |
| 14h   | Adrian Bevan   | <i>Machine Learning in High Energy Physics</i>   |
| 14h30 | Artur Garcez   | <i>Avoiding Deep Horses: Finding Structure in Deep Networks</i>                          |
| 15h   | Coffee   |  |
| 15h30 | Kiri Wagstaff<br>(via skype)   | <i>Understanding machine learning model expertise</i>                                    |
| 16h00 | A performance of traditional music with tunes generated by a “horse”<br>( <a href="https://github.com/IraKorshunova/folk-rnn">https://github.com/IraKorshunova/folk-rnn</a> )<br>Rob Webb, Eimear McGeown, and Nigel Stevens |  |
| 16h30 | Trip to the Half Moon Pub  |  |



# The year in “horses”

*Bob L. Sturm*



Queen Mary  
University of London

centre for digital music

# Automated Inference on Criminality using Face Images

Xiaolin Wu, Xi Zhang

(Submitted on 13 Nov 2016 ([v1](#))

We study, for the first time, automated inference on criminality using face images of 1856 real persons, whom were convicted criminals. Our classifiers perform consistently better than other classifiers. We also study the discriminative structural distance, and the so-called kernel trick. The kernel trick is that criminal and non-criminal faces among criminal faces is similar. The kernel trick consists of criminal and non-criminal faces lying in the kernel with a positive inner product. In other words, the faces of general people are similar to the faces of criminals, or criminals are similar to other criminals.

Subjects: Computer Vision and Pattern Recognition

Cite as: arXiv:1611.04135 [cs.CV]

(or arXiv:1611.04135 v1)



(a) Three samples in criminal ID photo set  $S_c$ .



(b) Three samples in non-criminal ID photo set  $S_n$ .

Figure 1. Sample ID photos in our data set.

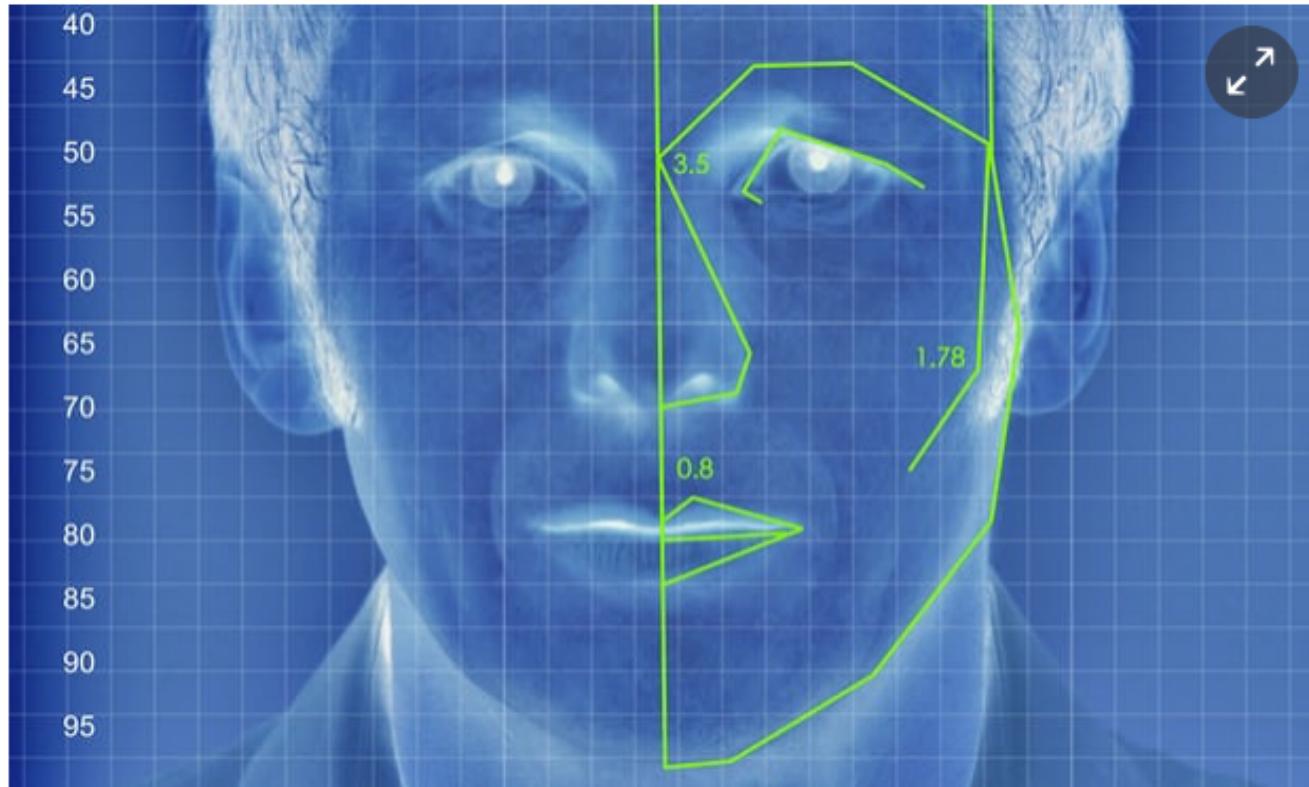


Queen Mary  
University of London

Centre for Digital Music

# New AI can guess whether you're gay or straight from a photograph

An algorithm deduced the sexuality of people on a dating site with up to 91% accuracy, raising tricky ethical questions



*i* An illustrated depiction of facial analysis technology similar to that used in the experiment. Illustration: Alamy



Sam Levin in San Francisco [Twitter](#) [Email](#)  
Friday 8 September 2017 00.46 BST

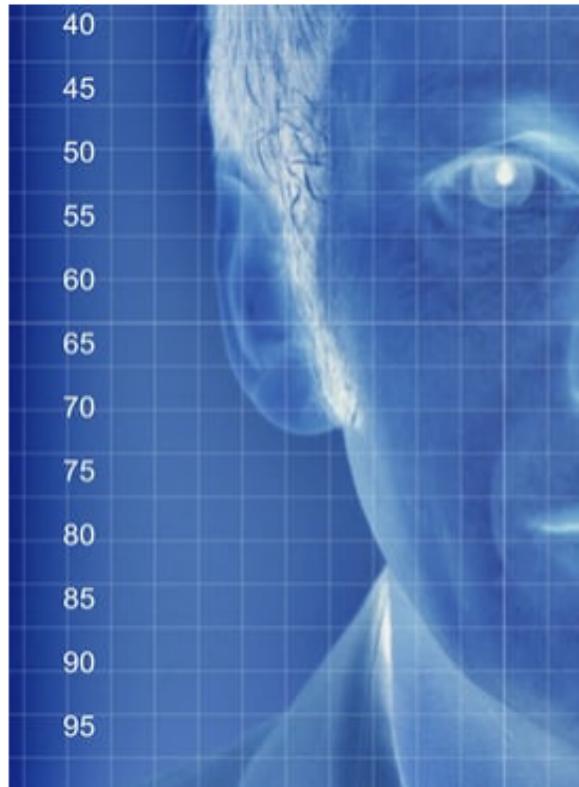
<https://osf.io/zn79k/>

57,881

ntre for digital music

# New AI can guess straight from a ph

An algorithm deduced the sexuality accuracy, raising tricky ethical quest



1 An illustrated depiction of facial analysis techn



Sam Levin in San Francisco



Friday 8 September 2017 00.46 BST

# Face-reading AI will be able to detect your politics and IQ, professor says

Professor whose study suggested technology can detect whether a person is gay or straight says programs will soon reveal traits such as criminal predisposition



1 Your photo could soon reveal your political views, says a Stanford professor. Photograph: Frank Baron for the Guardian



Sam Levin in San Francisco



Tuesday 12 September 2017 08.00 BST



New AI can guess Face-reading AI will be able to detect straight from a ph your politics and IQ, professor says



## LADDERS

ARTIFICIAL INTELLIGENCE

New app scans your face and tells companies whether you're worth hiring



By Monica Torres Aug 25, 2017

Human job recruiters can only physically juggle so many candidates at once. [HireVue](#), a company with a "video interview intelligence platform," wants to make that easier by using artificial intelligence to do the heavy lifting for you and screen multiple candidates at once.

Guardian



Sam Levin in San Francisco



Friday 8 September 2017 00.46 BST



Sam Levin in San Francisco



Tuesday 12 September 2017 08.00 BST

5,987

546

# A 'potentially deadly' mushroom-identifying app highlights the dangers of bad AI

*The app's creator says it's just a guide, but experts aren't happy*

by James Vincent | @jjvincent | Jul 28, 2017, 7:11am EDT

[f SHARE](#) [t TWEET](#) [in LINKEDIN](#)



If you're trying to identify a fungus, there shouldn't be mush-room for doubt. | Image: [Lucas Dumrauf / Creative Commons](#)

music

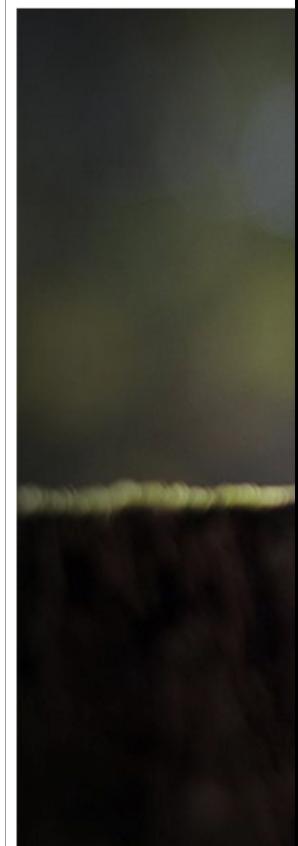
# A 'pote app hig

*The app's creat*

by James Vincent | @jjv

f SHARE

tweet TWE



## Why a computer could help you get a fair trial

### John Naughton

Recent research suggests that AI could make a valuable contribution to the judicial process



Leo McKern as Rumpole of the Bailey. Creator John Mortimer said the fictional barrister's generation was being replaced by 'greyish figures who think that the art of advocacy has been replaced by computer technology'.  
Photograph: Ronald Grant



If you're trying to identify  
Creative Commons

Sunday 13 August 2017 07.00 BST

425  
98

music

# A 'pote app hig

*The app's creat*

by James Vincent | @jjv

f SHARE

t TWE



If you're trying to identify  
Creative Commons

Why a comp  
John Naught

Recent research suggests



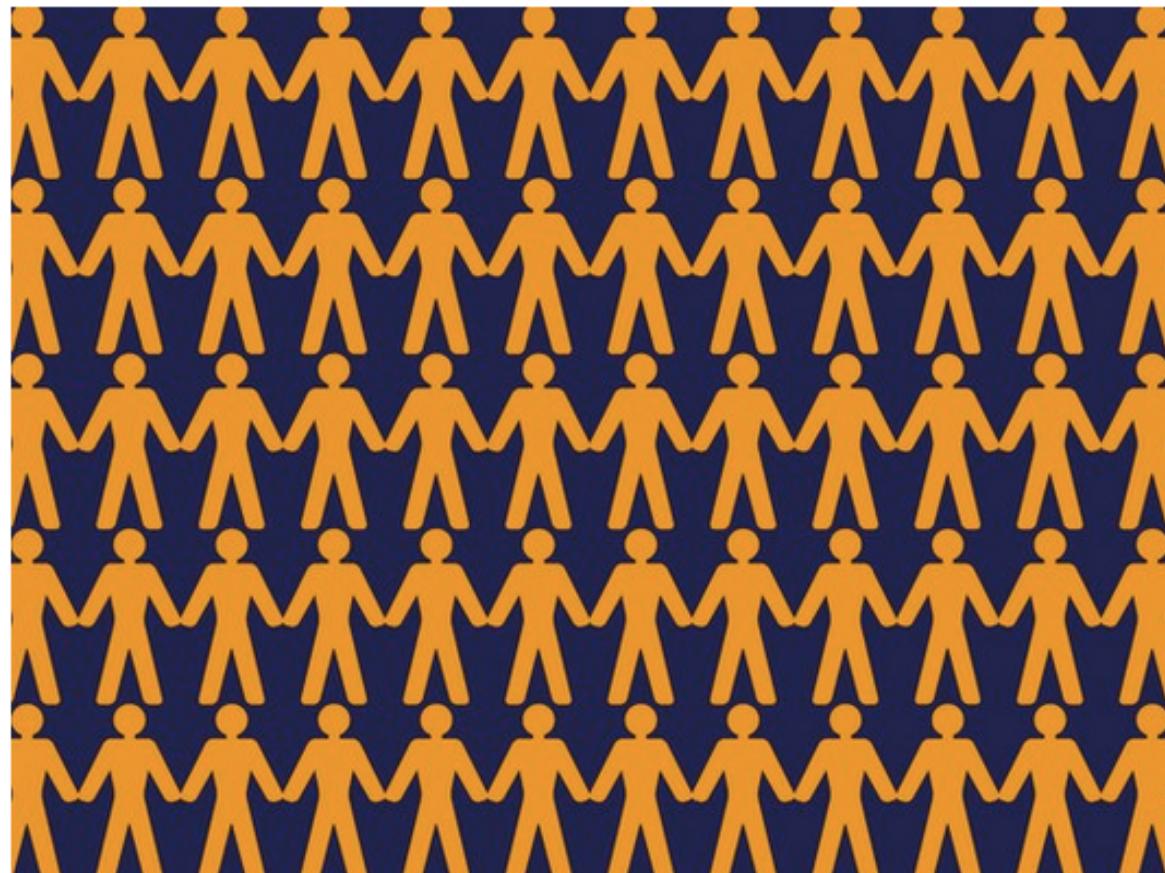
Leo McKern as Rumpole of the Bailey replaced by 'greyish figures who thi  
Photograph: Ronald Grant



Sunday 13 August 2017 07.00 BST

JASON TASHEA OPINION 04.17.17 07:00 AM

# COURTS ARE USING AI TO SENTENCE CRIMINALS. THAT MUST STOP NOW



# My own “hobby horse”

folk music modelling with LSTM <https://github.com/IraKorshunova/folk-rnn>

76 commits 1 branch 0 releases 3 contributors MIT

Branch: master New pull request Create new file Upload files Find file Clone or download

bobisturm committed on GitHub Update README.md Latest commit 52a7d37 22 hours ago

| File           | Description                                 | Time          |
|----------------|---|---------------|
| configurations | bugfix                                      | a year ago    |
| data           | change to readme                            | a year ago    |
| metadata       | Updated metadata with newer trained models  | a year ago    |
| samples        | add metadata and samples                    | 2 years ago   |
| soundexamples  | Update README.md                            | a year ago    |
| .gitignore     | clean before checkout                       |               |
| LICENSE        | license                                     |               |
| README.md      | Update README.md                            |               |
| data_iter.py   | added 1hot option                           |               |
| logger.py      | bugfix                                      |               |
| sample_rnn.py  | added terminal output, fixed initialisation | 10 months ago |
| train_rnn.py   | bugfix                                      | a year ago    |
| README.md      |   |               |

“Music” Generator

Folk music style modelling using LSTMs

University of London

gital music

The Endless Traditional Music Session

Music generated and titled by a [recurrent neural network](#), trained on over 23,000 tunes from ABC code posted on [Session](#)

This set is performed by *The First Me Schoast* (playlist updated every 5 minutes).

Now with 35809 tunes!

Total number of tunes generated now: 35809

Created by: [Bob L. Sturm](#) and [João Felipe Santos](#). ([More info.](#))

University of London

Centre for digital music

# Increased calls for transparency!

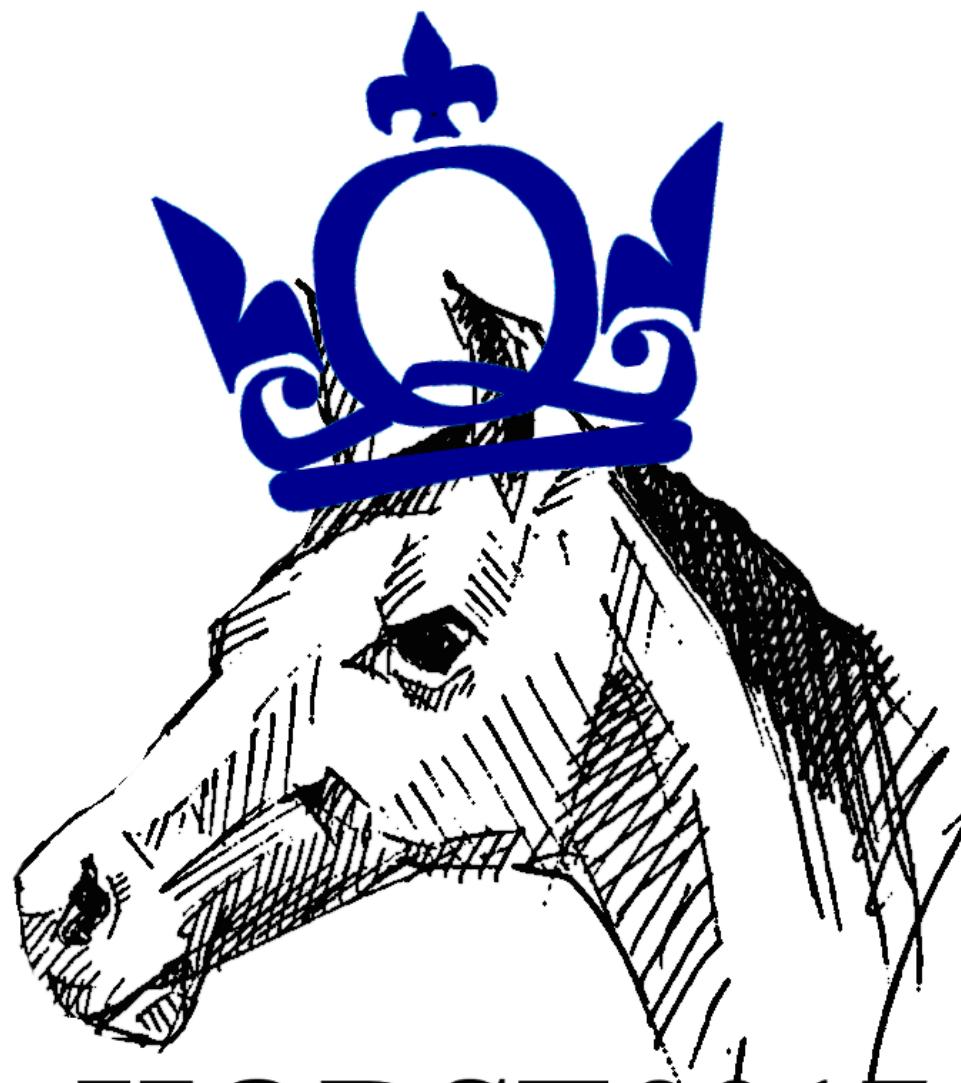
- \* <http://unbias.wp.horizon.ac.uk/>
  - \* “Emancipating Users Against Algorithmic Biases for a Trusted Digital Economy”
- \* “AI watchdog needed to regulate automated decision-making, say experts” *The Guardian* (27/01/17)
  - \* Alan Winfield, professor of robot ethics at the University of the West of England: “My challenge ... is to invent a deep learning system that can explain itself.”
- \* UK Parliament: “Algorithms in decision-making inquiry”  
<https://www.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2015/inquiry9/publications/>



# Increased work on transparency & interpretability

- \* Interpretable ML for Complex Systems, NIPS '16 Workshop  
<https://sites.google.com/site/nips2016interpretml>
- \* Fairness, Accountability, and Transparency in Machine Learning (FAT/ML) <http://www.fatml.org>
- \* *Calling Bullshit: Data Reasoning for the Digital Age*  
University of Washington (<http://callingbullshit.org>)
  - \* **Synopsis:** Our world is saturated with bullshit.  
Learn to detect and defuse it.





Queen Mary  
University of London

centre for digital music