Transparency
Data science that provides transparency –
How to clarify answers such that they become indisputable?

December 2, 2016
Jack van Wijk
We need transparency!

- you may also like that book
- you are not illegible for a loan
- you must get an expensive treatment
- you are fired
- you do not get parole
What data was used?

What assumptions are made?

What reasoning is used?

What criteria are used?

Data → Model → Decision → Model definition
BaobabView: Visualization of decision trees (vd Elzen et al., 2011)
Rationale visualization (Scheepens et al., 2015)

- More likely
- Slightly more likely
- Slightly less likely

**Is Smuggling**
- 360 Turn
- Pilot or Tug
- Collision In The Past

**Hides Identity**
- Inside Forbidden Area
- Smuggled In The Past
- Repainted On Sea
- Rendezvous

**Spoofed AIS ID**
- Contraction

The vessel may be reckless because it may be a smuggler, is not a pilot or a tug, and has collided in the past.
The vessel may be a smuggler because it is trying to hide its identity.
The vessel is trying to hide its identity by spoofing the identity it is broadcasting.
What data was used?

Data

What reasoning is used?

Model

What assumptions are made?

Model definition

What criteria are used?

Decision

We need transparency!
But is this feasible?

We need transparency!
But is this feasible?
We need transparency!
But is this feasible?
Transparency cannot be achieved, because

• Processing pipelines are too complex
  • no way we can understand what a deep learning network is doing

• Understanding requires too much domain expertise
  • you can only understand this if you have studied medicine

• It blocks innovation
  • explaining everything is expensive, methods like deep learning cannot be used

• It opens the door to fraud
  • tell the outside world what heuristics and proxies we use? no way!
To achieve more transparency, we need

A) Better technology?
   • to explain what complex methods are doing

B) Legislation?
   • enforce that decisions are always clear and transparent

C) Make companies accountable?
   • companies must be able to explain what they do

D) Free markets?
   • such that the most transparent companies will win

E) Consumer organizations, press attention?
   • blame and shame ill-behaving companies and governments