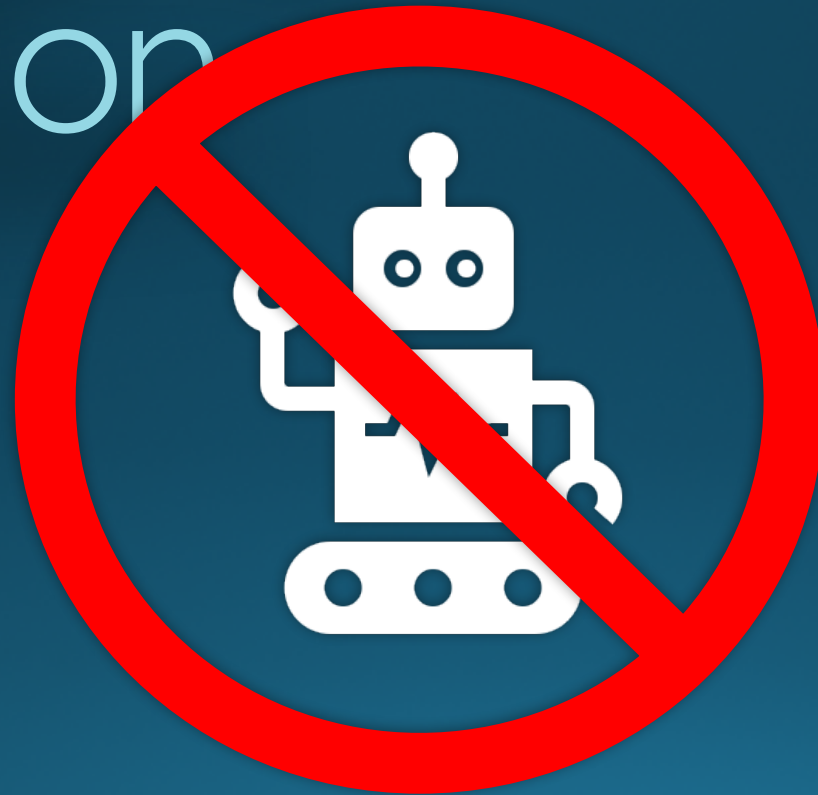


# a case against automation



Robin Gilijamse

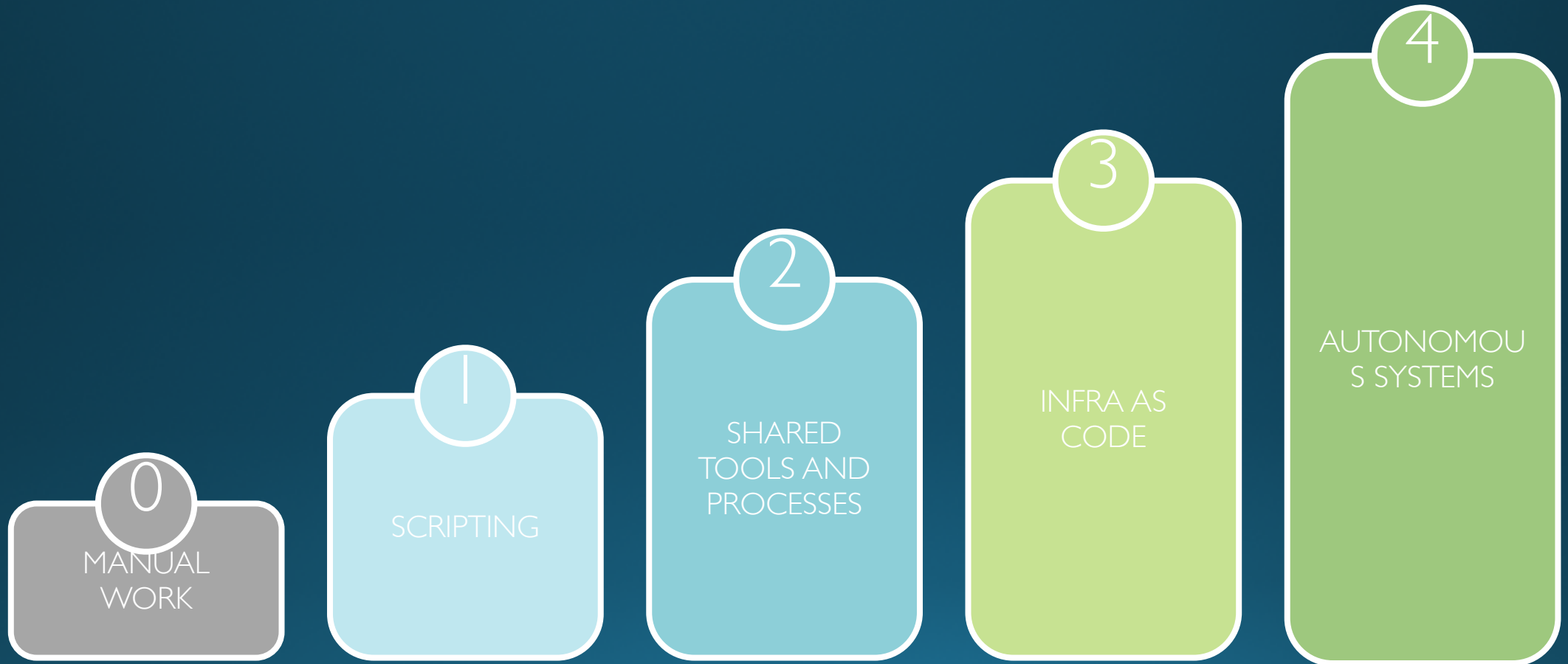
@interestingtraffic@noc.social

“

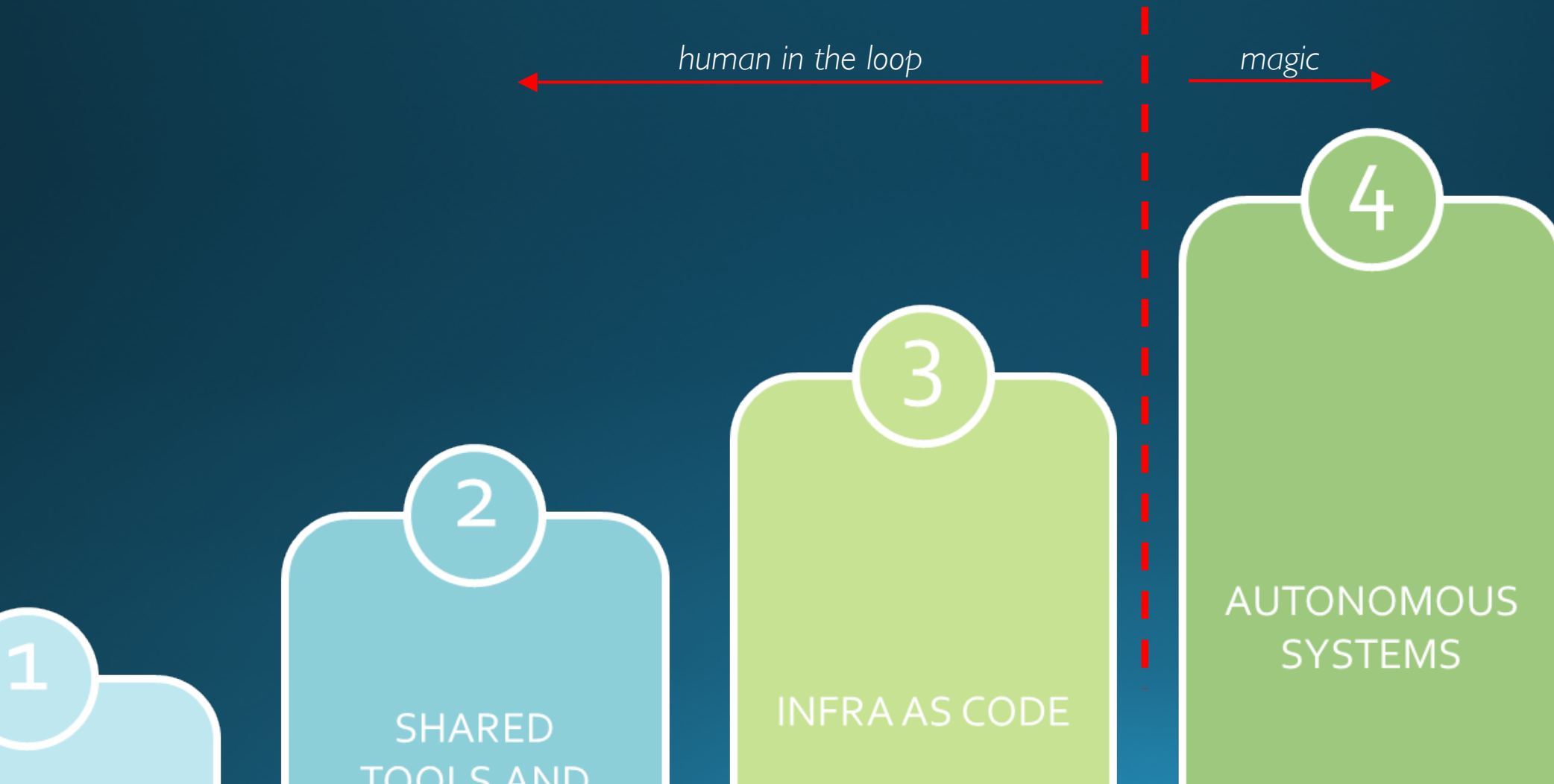
My definition of an expert in any field is a person who knows enough about what's really going on to be scared. ”

P.J. Plauger, *Computer Language*, March 1983

# automation maturity



# removing human error



A man in a blue long-sleeved shirt is sitting at a black table outdoors. He is holding a black mug. On the table are a microphone, a white napkin, and a black mug. A sign is attached to the front of the table with the text: "AI is automation without institutional knowledge" and "CHANGE MY MIND". The background shows a brick-paved area, a lawn, and some trees.

AI is automation  
without  
institutional knowledge

---

CHANGE MY MIND

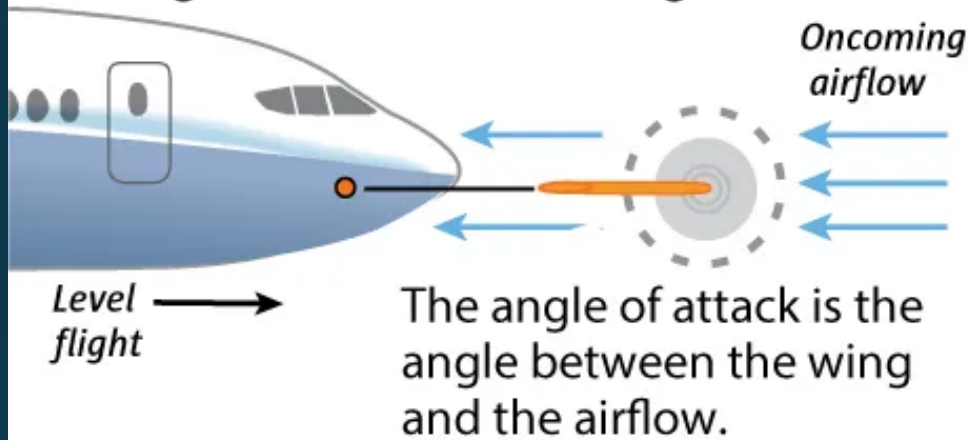
~~a more efficient engine~~  
a way to save money



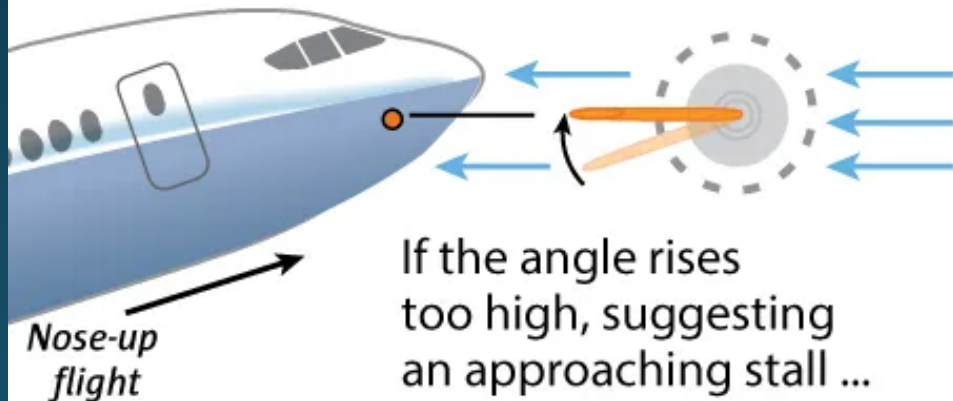
©SAFRAN, All rights reserved

# How the MCAS (Maneuvering Characteristics Augmentation System) works on the 737 MAX

1. The angle-of-attack sensor aligns itself with oncoming airflow.

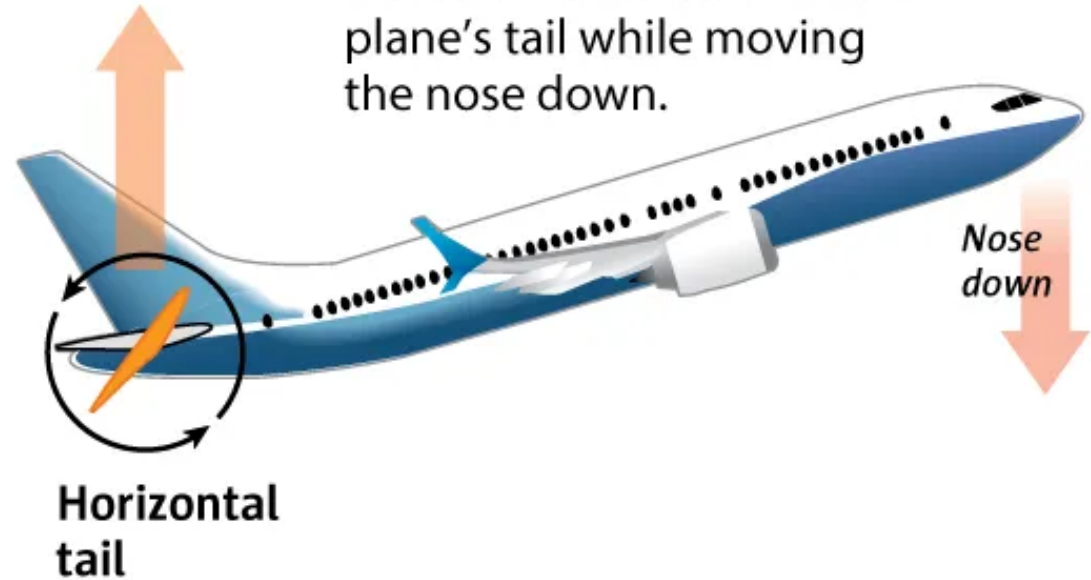


2. Data from the sensor is sent to the flight computer.



... the MCAS activates.

3. MCAS automatically swivels the horizontal tail to lift the plane's tail while moving the nose down.



Sources: Boeing, FAA, Indonesia National Transportation Safety Committee, Leeham.net, and The Air Current

Reporting by DOMINIC GATES,  
Graphic by MARK NOWLIN / THE SEATTLE TIMES

# Automation Surprise

An automation surprise can then be defined as the end result of a **deviation between expectation and actual system behavior** that is only discovered after the crew notices strange or unexpected behavior and that may already have led to serious consequences by that time.



OCTOBER 29, 2018

**BBC**  
NEWS

**Lion Air crash: Boeing 737 plane  
crashes in sea off Jakarta**

MARCH 10, 2019

*The New York Times*

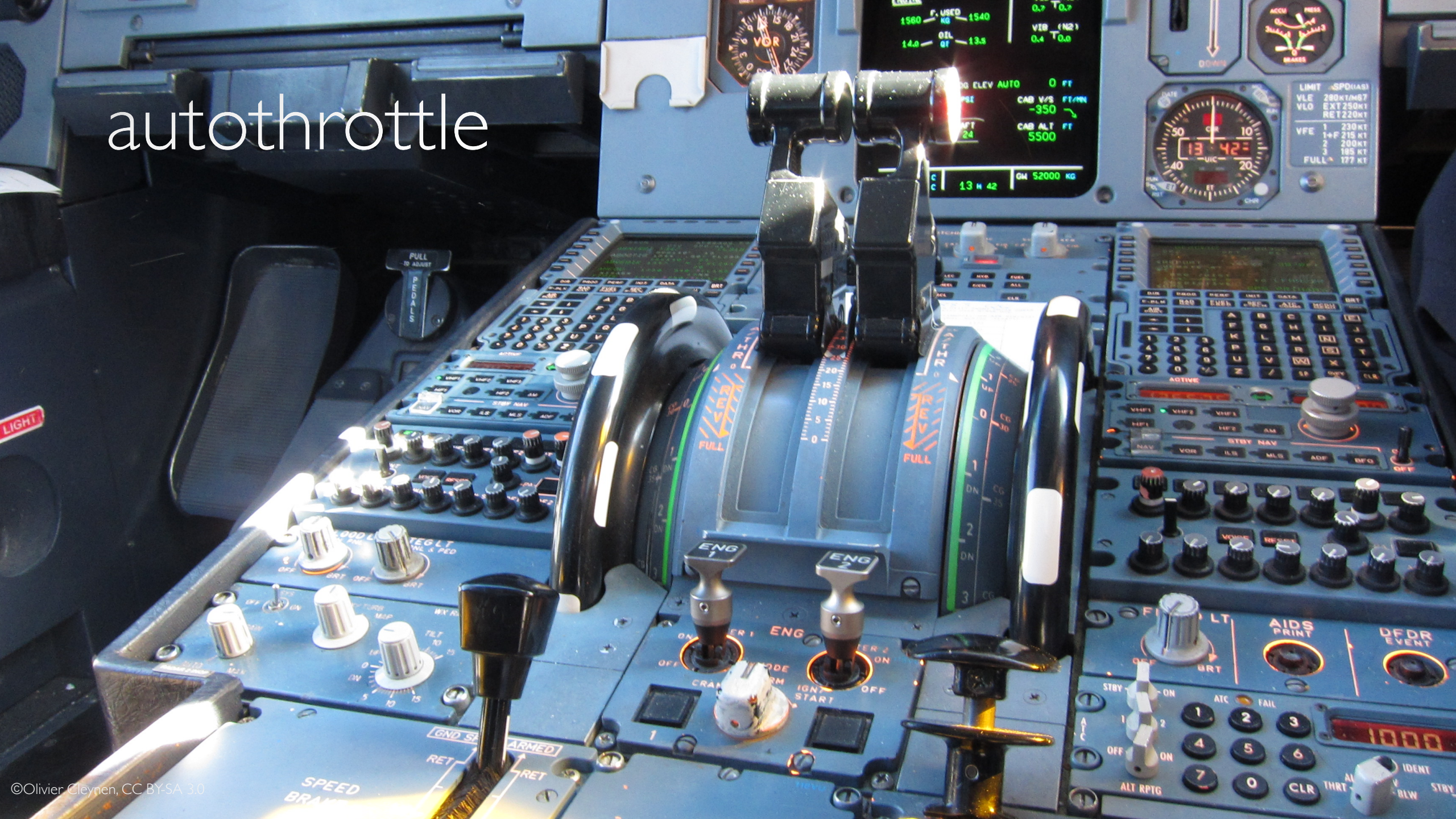
**Ethiopian Airlines Plane Is the 2nd  
Boeing Max 8 to Crash in Months**



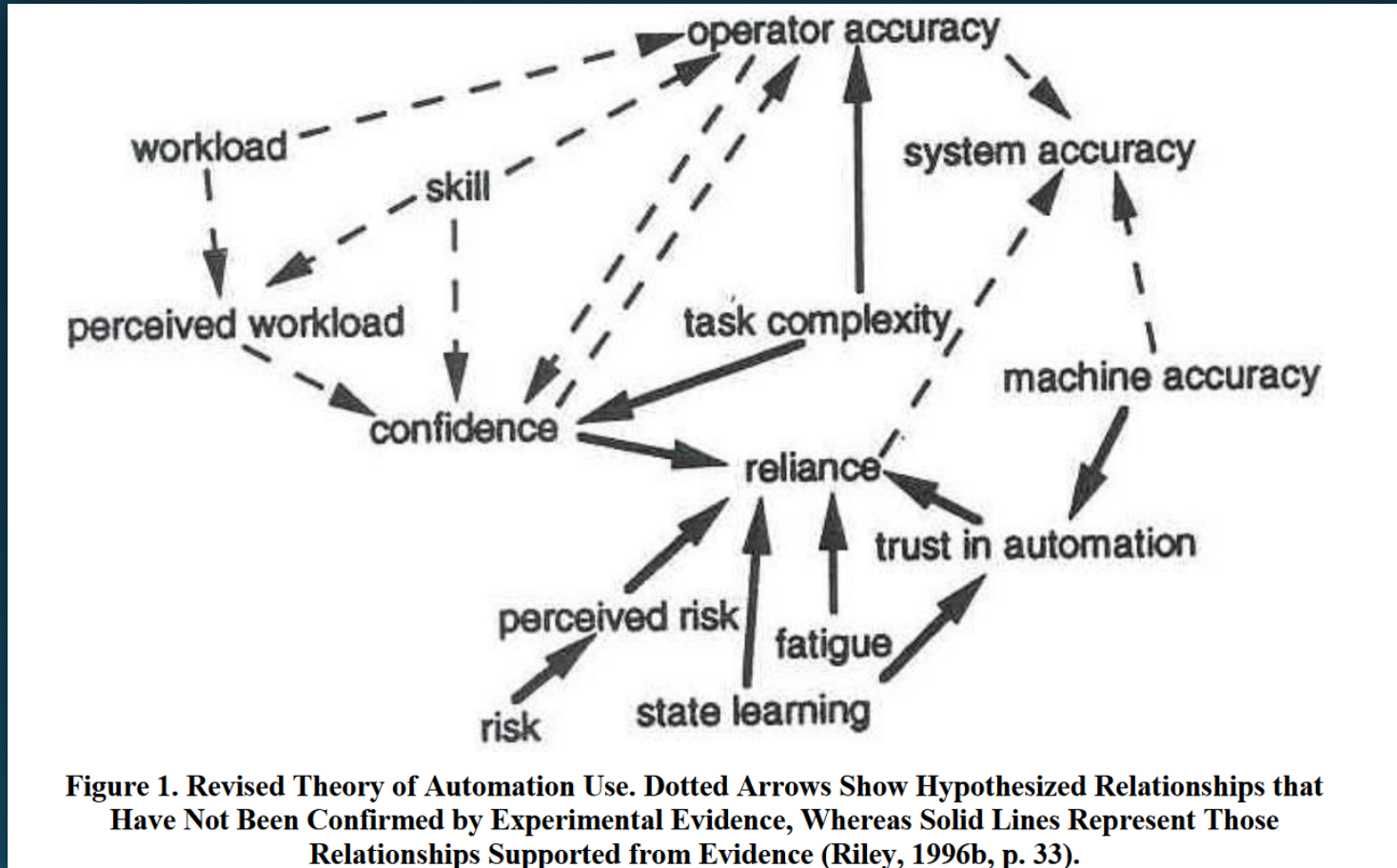
*just keep  
an eye on  
the system*



autothrottle

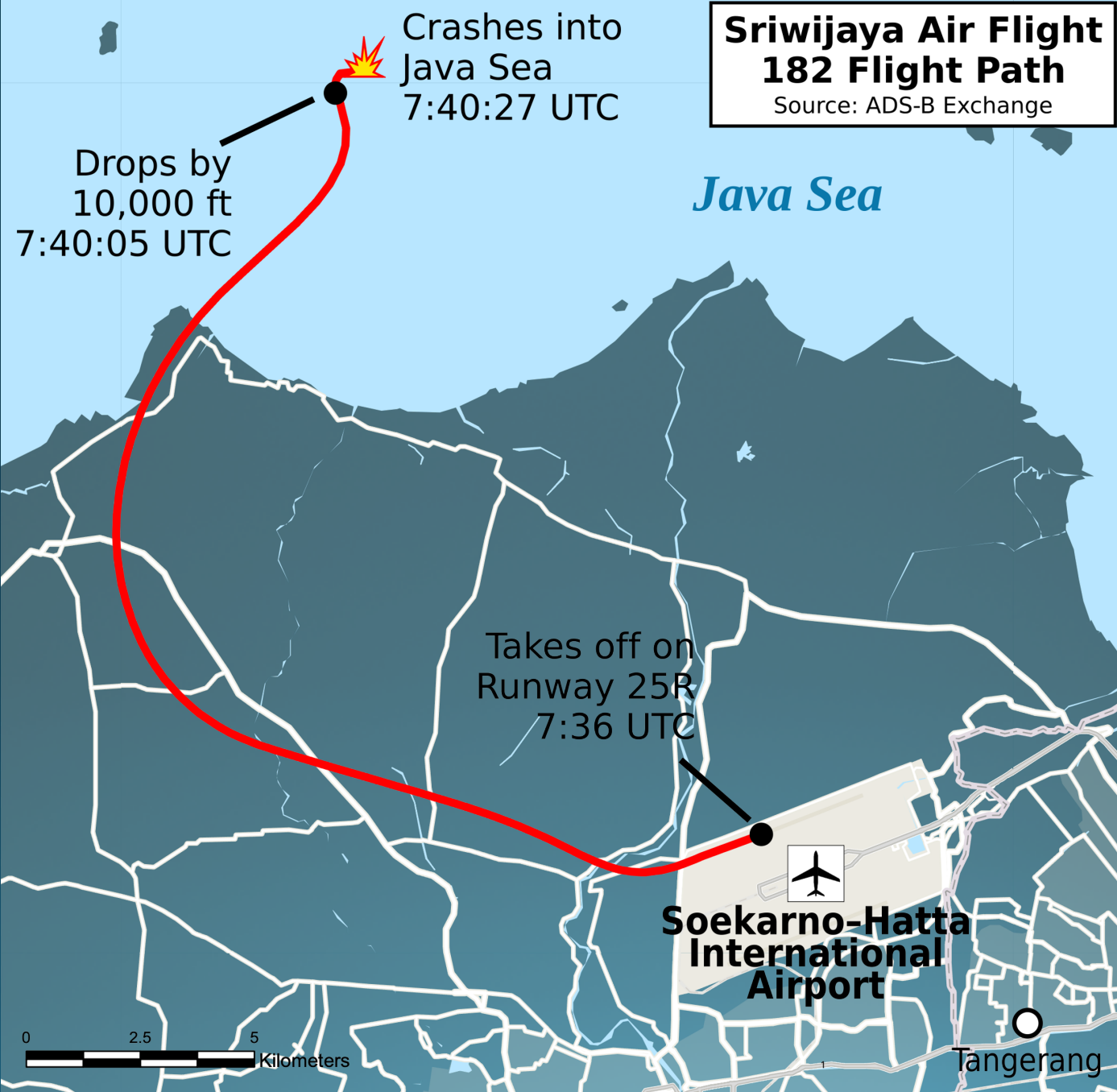


# Automation-Induced Complacency

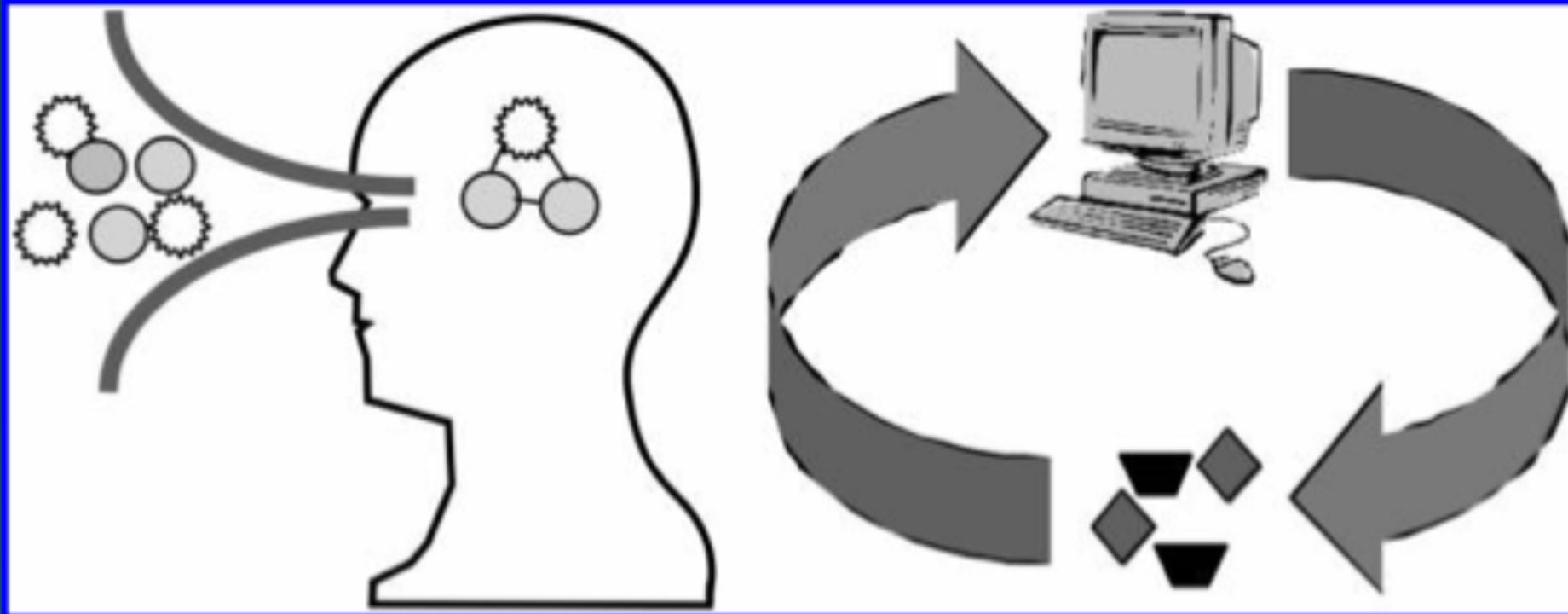


# Sriwijaya Air Flight 182 Flight Path

Source: ADS-B Exchange

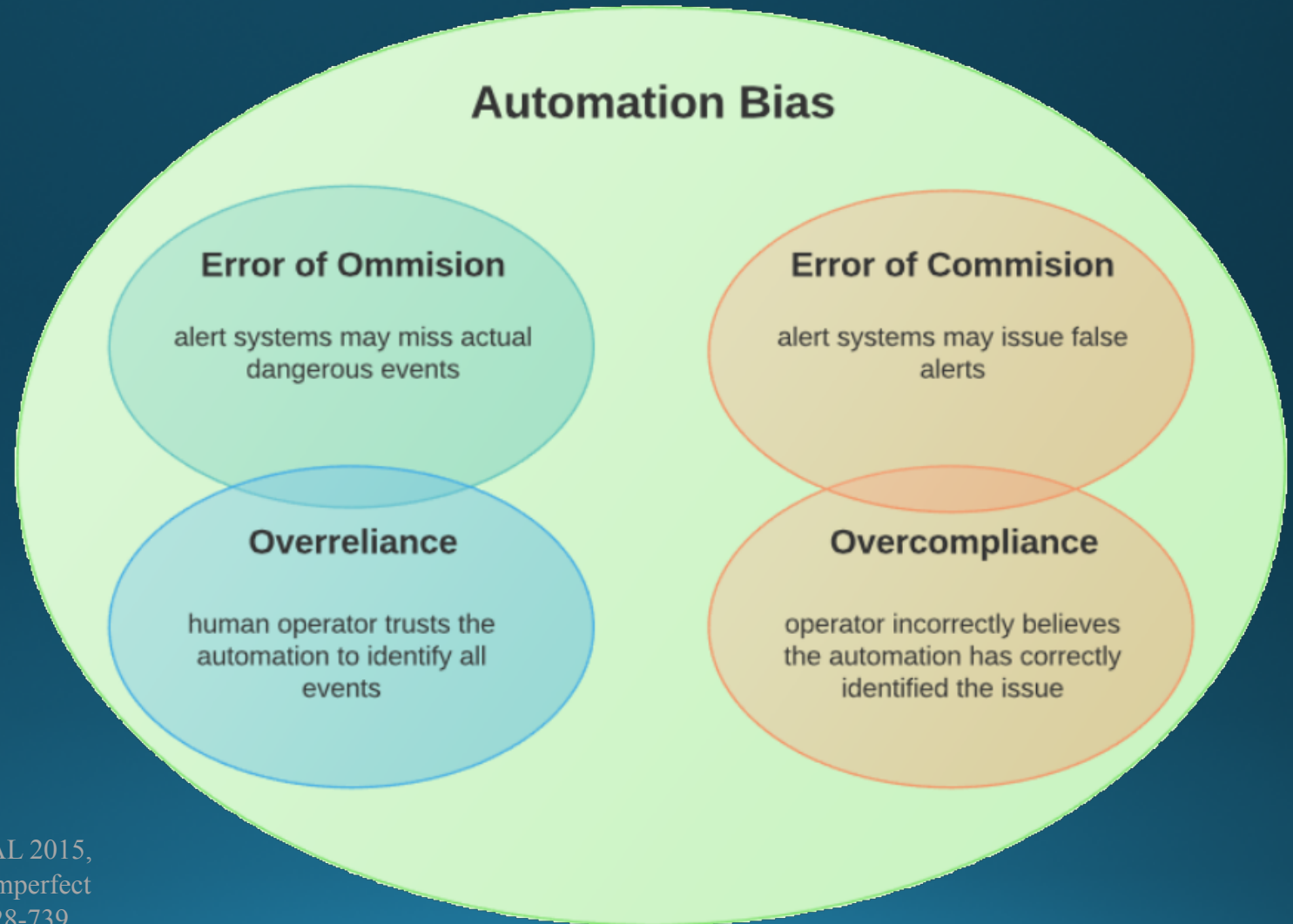


*what if we keep a human in the loop?*



Endsley, MR & Jones, DG 2012, 'SA demons: the enemies of situational awareness'

# Automation Bias



Wickens, CD, Clegg, BA, Vieane, AZ, & Sebok, AL 2015, 'Complacency and automation bias in the use of imperfect automation', Human Factors, vol. 57, no. 5, pp. 728-739.

Partly Cloudy

Partly cloudy and continued warm. (Details, Page 2A.)

FRIDAY'S TEMPERATURES

8 a.m.	59	2 p.m.	76	8 p.m.	72
10 a.m.	73	4 p.m.	75	10 p.m.	70
Noon	75	6 p.m.	73	Midnight	70

# The Miami Herald

Saturday, December 30, 1972

Florida's Complete Newspaper

76 Pages

Two Latin American Editions Are Published Daily

Final

10 Cents

63rd Year — No. 30

# N.Y.-to-Miami Plane Crashes In Everglades With 167 Aboard

*Is Razing  
Of Hanoi  
U.S. Aim?*

Civilian Areas Bombed, Reporter Says .....22A

Fighters Hit Anti-B52 Missiles .....22A

By GEORGE ESPER



Eastern  
Jet Left  
Kennedy

Hospitals Report  
Some Survivors

By ARNOLD MARKOWITZ  
Herald Staff Writer

An Eastern Airlines jet carrying 154 passengers and a crew of 13 crashed late Fri



**AI  
WILL KILL  
US ALL**





# Situational Awareness



Don't undervalue the human

A decorative border in a light blue color, featuring stylized flowers and leaves. The border is composed of four corner pieces and a bottom piece, framing the central text. The corner pieces are L-shaped, with one side having a larger flower and the other side having smaller flowers. The bottom piece is a horizontal line of smaller flowers.

Enjoy, but  
automate in  
moderation