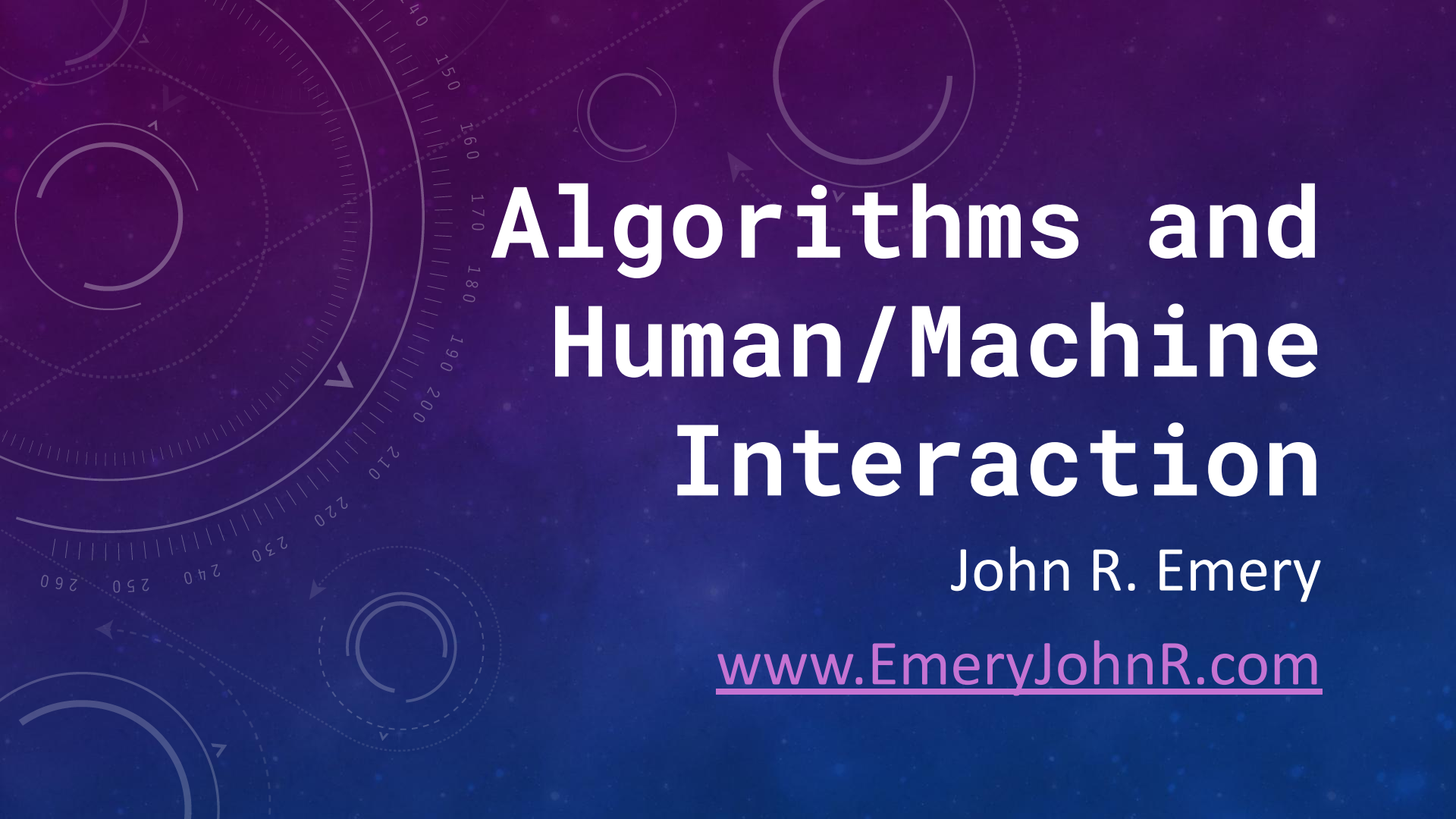


The background is a dark blue gradient with faint, light blue concentric circles and degree markings (140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260) on the left side, suggesting a circular scale or a clock face. The main title is centered in a large, white, sans-serif font.

Algorithms and Human/Machine Interaction

John R. Emery

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In A Past Life...



- Asst. Professor of International Security
- Ethics of War
- Human/Machine Interaction
- Technology & War
- History of Wargaming

OVERVIEW

- U.S. Warfighting: Appeals to technological superiority as ethical superiority
- Disconnect between what systems are capable of vs. mythologized ideas about them
- Psychology of human/machine interaction
- Concrete case-studies of catastrophic consequences
- Implications for technical community

Jus in Bello – Ethics of War



TARGETED KILLING & TECHNOLOGY

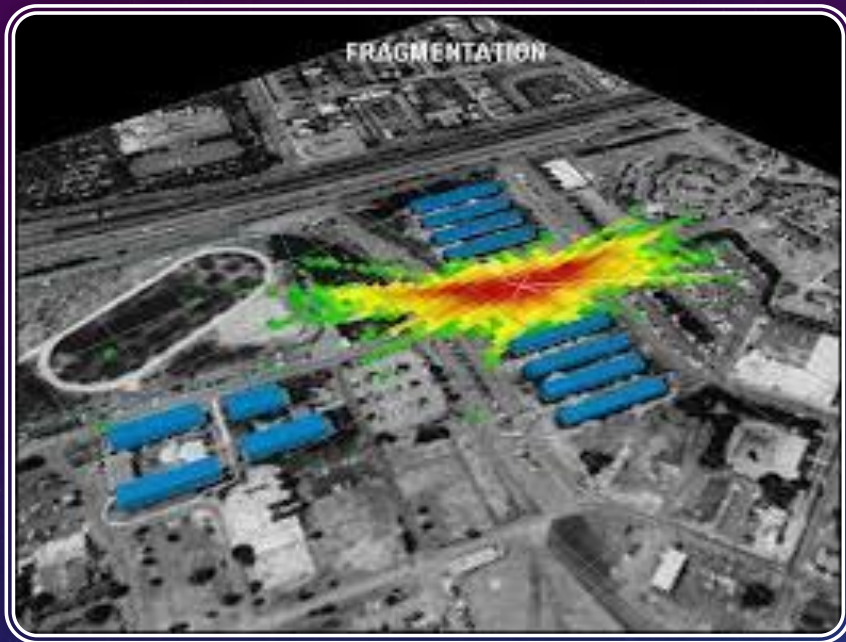
- Targeted Killing in Non-War Zones
- Imminence and Preventive Force
- “Surgical Strike”
SKYNET
- Appeals to Technical Process, Not Outcomes





Meaningful Human Control & Killer Robots

- Generating vs. Executing Targeting
- DOD Policy: Human in-the-loop
- Psychology of human-machine interaction
- Automation bias
- Moral crumple zones



Collateral Damage Estimation Tool

- Ad Hoc Evolution
- CDET to Bugsplat
- Myth & Discourse
- Due Care – Software Update

Fundamental Flaws of Bugsplat



ARBITRARY
CEILING OF 30
CIVILIAN
CASUALTIES



SYSTEM
OVER-ESTIMA
TIONS



BLACK BOX
ALGORITHMS
SEEKING A
NUMBER



LACK OF
EMPIRICAL
DATA



HUMAN
CONTROL &
AUTOMATION
BIAS

A military drone, likely an MQ-9 Reaper, is shown in flight over a desert landscape. The drone is white with a large, bulbous nose and a V-shaped tail. It has several sensors and cameras mounted on its nose and wings. The background shows a hazy, mountainous desert terrain under a clear sky.

“WE KILL
PEOPLE
BASED ON
METADATA”

–Gen. Michael Hayden
Fmr. CIA Director



SKYNET

NEURAL NET-BASED ARTIFICIAL INTELLIGENCE

CYBERDYNE SYSTEMS CORPORATION

- Metadata ML Algorithm
 - U.S. Drone Program
 - Calculate Probabilities of Terrorism
 - Big Data
 - Unintended Consequences
-
- Probabilities Toward Death ([Emery 2020](#))
 - NSA's SKYNET ([Grothoff Porup 2016](#))

Production of Ethics



- Tech ticks the ethical box
- Absolves decision-makers of ethico-political dilemmas
- Judgement to computation
- Acceleration – meaningful inefficiencies

The Flash Crash – Lessons for Automating Assumptions



- Flash Crash – Stock Market
- Bureaucracies systematically underestimate the risk of accidents when assumptions fall out

AIR FRANCE 447 – 2009 A330 CRASH

- Fly-by-wire system, prioritizes computer control
- Cannot predict every possible event
- Frozen pitot tubes – no air speed readings
- STALL – point nose down
- 41-degree pitch, computer malfunction, STALL



Implications

- Myth of the “Technology”
- Appeals to process over outcome
- Accountability gaps
- Trust in AI
- The role of ethics