

# Free Will Revisited

*Hard Choices, Reflex of Freedom, and Pursuit of Happiness*

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# Free Will Revisited

## Free Will:

“a philosophical term of art for a particular sort of capacity of rational agents to choose a course of action from among various alternatives.”

(Stanford Encyclopedia of Philosophy)

# Free Will Revisited

## Robert Kane's position

1. alternative possibilities (AP), or the agent's power to do otherwise
2. ultimate responsibility (UR) via "self-forming actions" (SFA), those moments of indecision during which people experience conflicting wills.

**Not *every* choice is a SFA.**

**Not every choice is a *hard* choice.**

## Daniel Dennett's counter-argument

no guarantee that SFA will occur in an individual's life

=> the individual does not in fact have free will at all, according to Kane.

(Dennett, D. *Freedom Evolves*.)

## Free Will Revisited

If it looks like a dog and barks like a dog, it's probably a dog.

If it behaves like a dog, it's a model of a dog.

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**What about models of Free Will?**

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**A human being is an information-processing,  
dynamical physical system.**

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Can physical systems make a choice?

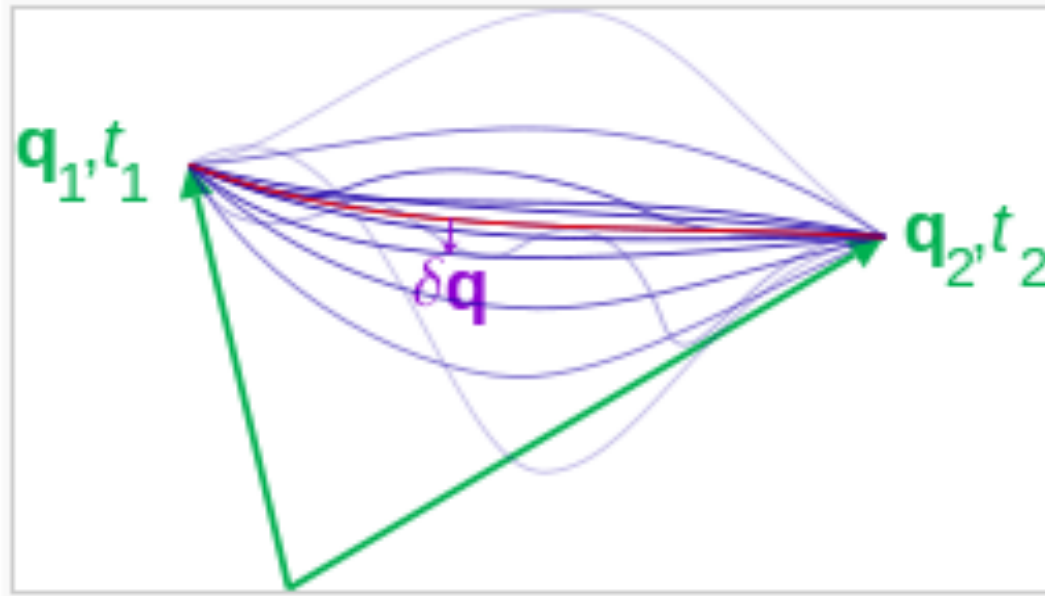


Fig. 1. The Least Action Principle

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**Can we predict the result of this choice?**

**only with limited accuracy for a limited time**

roulette wheel





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Can physical systems make *hard* choices?

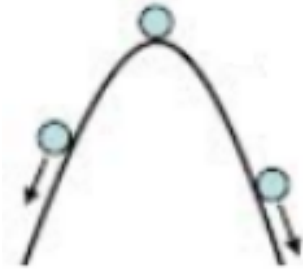


Fig. 2. Spontaneous break of symmetry

## Phase transitions:

liquid  $\leftrightarrow$  solid  $\leftrightarrow$  gas, paramagnetic  $\leftrightarrow$  ferromagnetic,  
laminar flow  $\leftrightarrow$  turbulent flow

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## Dynamical systems: attractors and bifurcations



Fig. 3. An attracting limit cycle

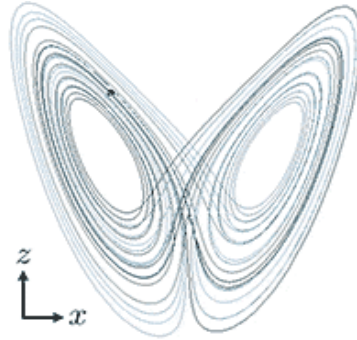


Fig. 4. "Strange" Lorenz Attractor

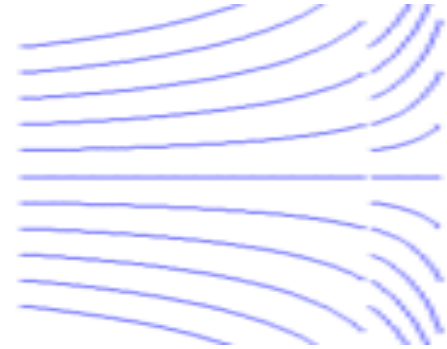


Fig. 5. Saddle-node bifurcation

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## Information-processing systems

- must be sensitive to weak signals
  - => amplification mechanisms (detectors)
  - => run near the limits of stability
- information storage => internalized attractors
  - => potential to adaptation by self-learning
- sensory inputs + memory => internal dynamics
  - => decisions => actions

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## Lessons learned from Model System 1 (MS1)

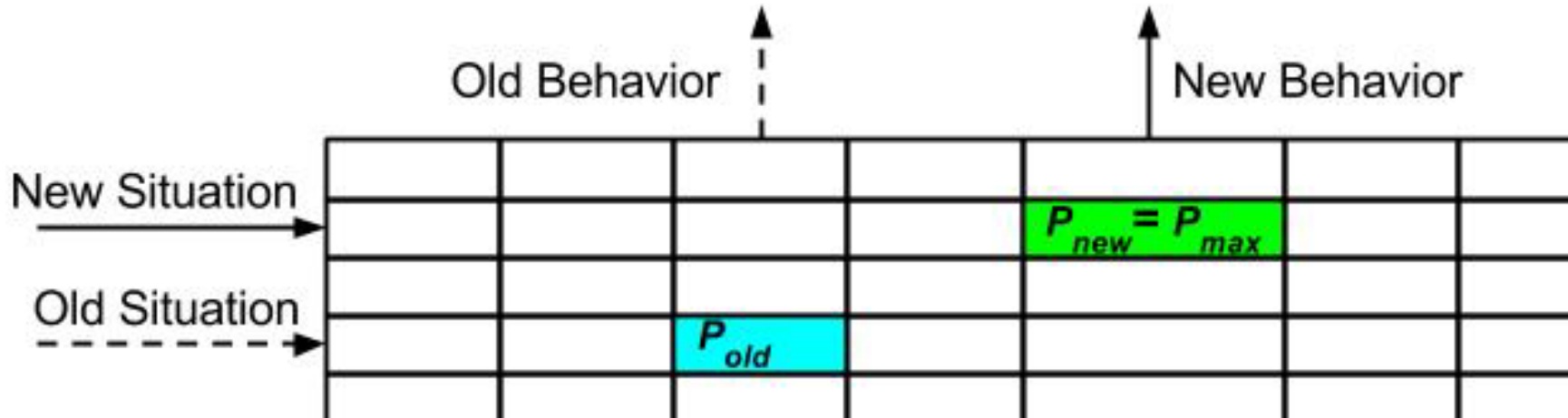
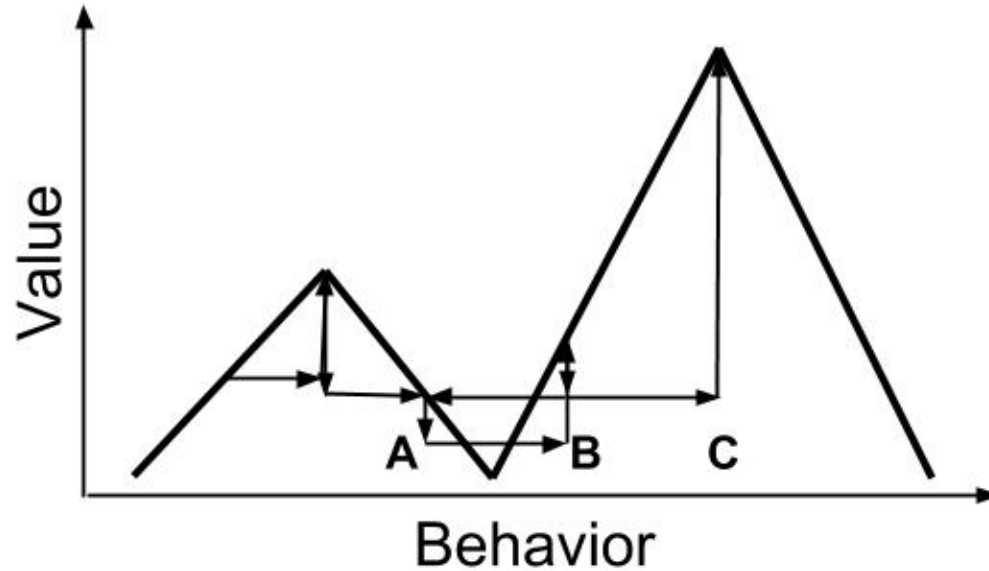


Fig. 6. Adaptation of MS1 by trial and error

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## Reflex of Freedom



**Fig. 7. Devaluation of current state**

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## Did MS1 have a Free Will?

- It made the *hard* choices
- These choices were *rational*
- They improved the odds of survival and successful adaptation
- MS1 or similar system could control a robot in *real* world

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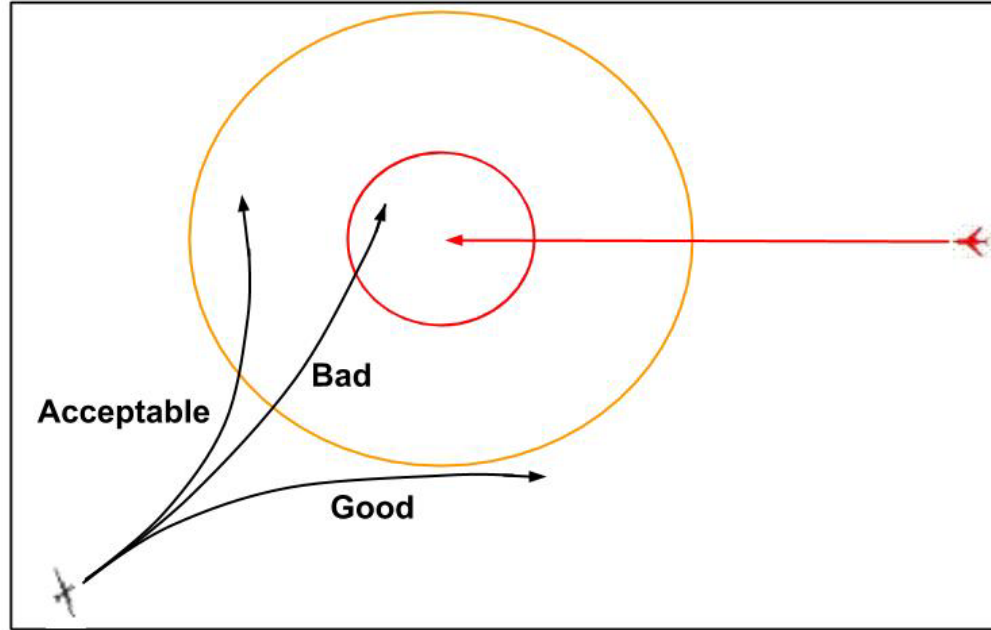
# Do pilots have a Free Will?



**Fig. 8. A pilot in a cockpit**

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## Do Sense-and-Avoid systems have a Free Will?



**Fig. 9. Maneuver selection by generic SAA algorithm**



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**SAA systems have to make the *hard* choices  
to deal with dynamic and uncertain environment**

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## Why we cannot avoid the hard choices

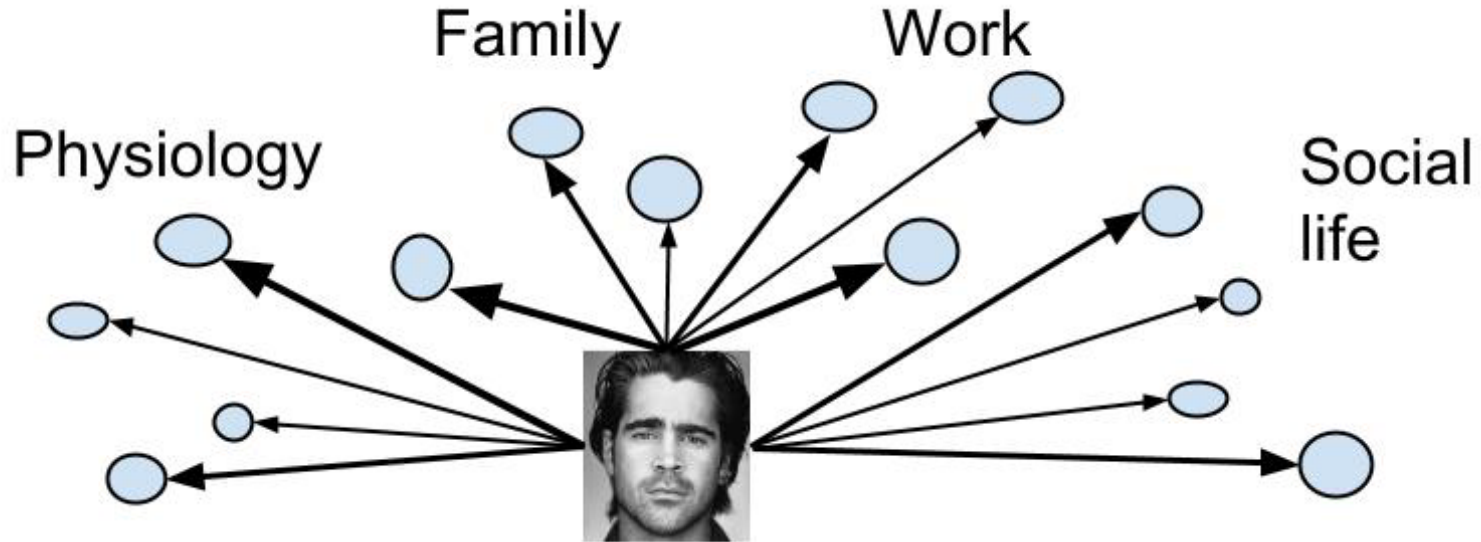


Fig. 10. Competing attractors

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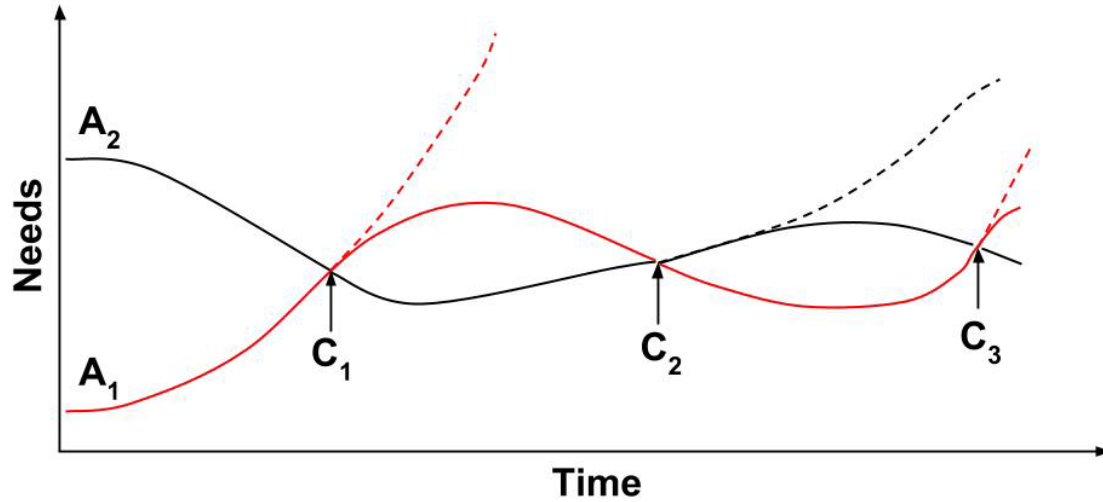


Fig. 11. Competing attractors in time

It is not possible that Kane's SFAs will never occur

**Dennett's counter-argument has no merit**

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## **The limits of responsibility**

- moral responsibility is a social instrument for control and self-control of human behavior
- no hard choices
  - => no way to influence behavior
  - => no responsibility

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## **Free Will and happiness:** the humanist perspective

- before to be happy, you need to be
- happiness “here and now” => consumerism => waste of resources, harm to people’s health and environment
- happiness is not a realistic goal because of reflex of freedom; pursuit of happiness is
- our duty is to drive people away from their comfort zone  
=> informed choices  
=> see and solve the problems

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### Free Will and happiness: a personal perspective

*I have a lot that can be lost if I decide to start again,  
I don't want to pay this cost, I don't want to take new pain,  
But I am sure, anyway, that I am going one day  
To choose a new, unknown way, unknown way ...*

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**Questions?**

**Comments?**