

The Rediscovery of AM & EURISKO

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- Contents:
 - Symbolic AI vs. ML
 - Conquering Action Space
 - Heuristics
 - Rediscovering Prime Numbers: AM
 - Enlarging the Domain: EURISKO
 - Work after EURISKO: CYC
 - The Rediscovery
 - Q & A

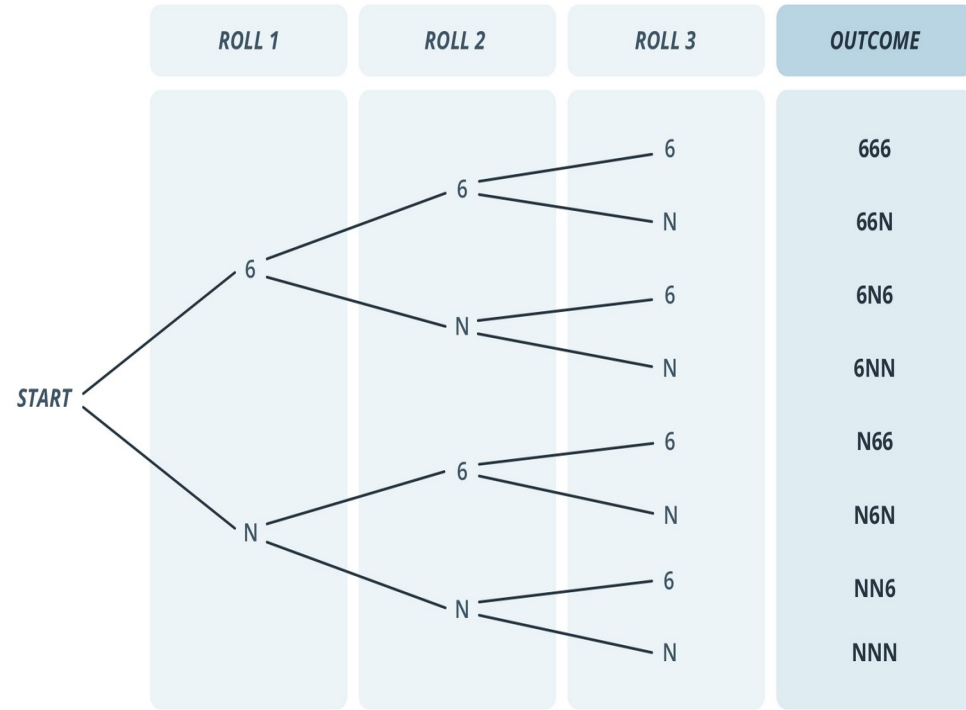
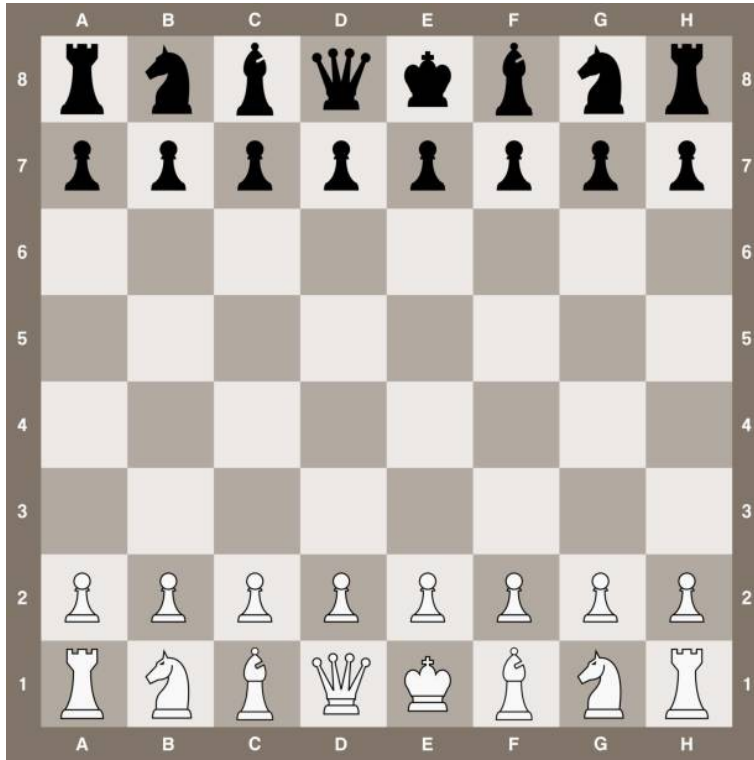
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- AI is divided into two camps, each one being mainstream for some years:
 - Machine Learning:
 - Automatic discovery of patterns in large datasets
 - e.g: NNs; Markov Models etc.
 - Symbolic omputation
 - Application of rules
 - Usage of formalisms
 - e.g: PROLOG

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- Action Space:
 - Most discrete, procedural problems can be mapped to a DAG, representing the possible actions at a given point:

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- Exhaustive Search
 - Breadth first
 - Depth first
- Random Search
 - e.g if Action Space is too large
- Heuristic Search
 - Apply Rules of Thumb

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- Heuristic:
 - From Greek “heurisko” : to search / to find
- Discovery System
 - Feed a Machine with some facts
 - Start Automated Reasoning
 - Profit!

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- In mid 70s, Doug Lenat applied this paradigm to the domain of Arithmetics:
- Feed it with Concepts
- Feed it with Heuristics
- Simple Loop
 - Identify interesting Goals' put them on Agenda
 - Try to Apply
 - Evaluate / spit out finds

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- One such “interesting” find:
 - “some number only have two Divisors”
 - → Prime Numbers (!)
- The Heuristics themselves were mutating:
 - A lot of “Invalid Mutants”
 - Generally: Shorter Rules had more valid/interesting “Offspring”

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- EURISKO: Enlarging the Domain
 - Started 1976 at Carnegie Mellon
 - Later at Stanford
- Games in general
- Chip Design
- Traveller TCS Strategy Game
 - “Try out extreme poles of possible solutions”
 - → Large Fleet of small ships

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- Work after EURISKO: CYC
 - DARPA funded
 - “What are the logical facts needed to understand an Encyclopedia”
 - Common Sense as a Brick Wall
 - <https://cyc.com/>
 - Still ongoing (since nearly 4 Decades)

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- The Rediscovery: A sad Start:

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*Douglas Lenat, Who Tried to Make
A.I. More Human, Dies at 72*

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- 'Death is the ultimate Deadline' (in an Interview with Lex Fridman)
- <https://www.youtube.com/watch?v=3wMKoSRbGVs>

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- Shortly after:
 - <https://news.ycombinator.com/item?id=38413615>
 - <https://white-flame.com/am-eurisko.html>
 - [https://www.saildart.org/\[*DBL\]/](https://www.saildart.org/[*DBL]/)

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- Links

- https://en.wikipedia.org/wiki/Automated_Mathematician
- <https://en.wikipedia.org/wiki/Eurisko>
- <https://white-flame.com/am-eurisko.html>
- <https://github.com/white-flame/am>
- <https://github.com/white-flame/eurisko>
- <https://github.com/aindilis/eurisko-resources>
- <https://discord.gg/vhsmVCwgvK>