



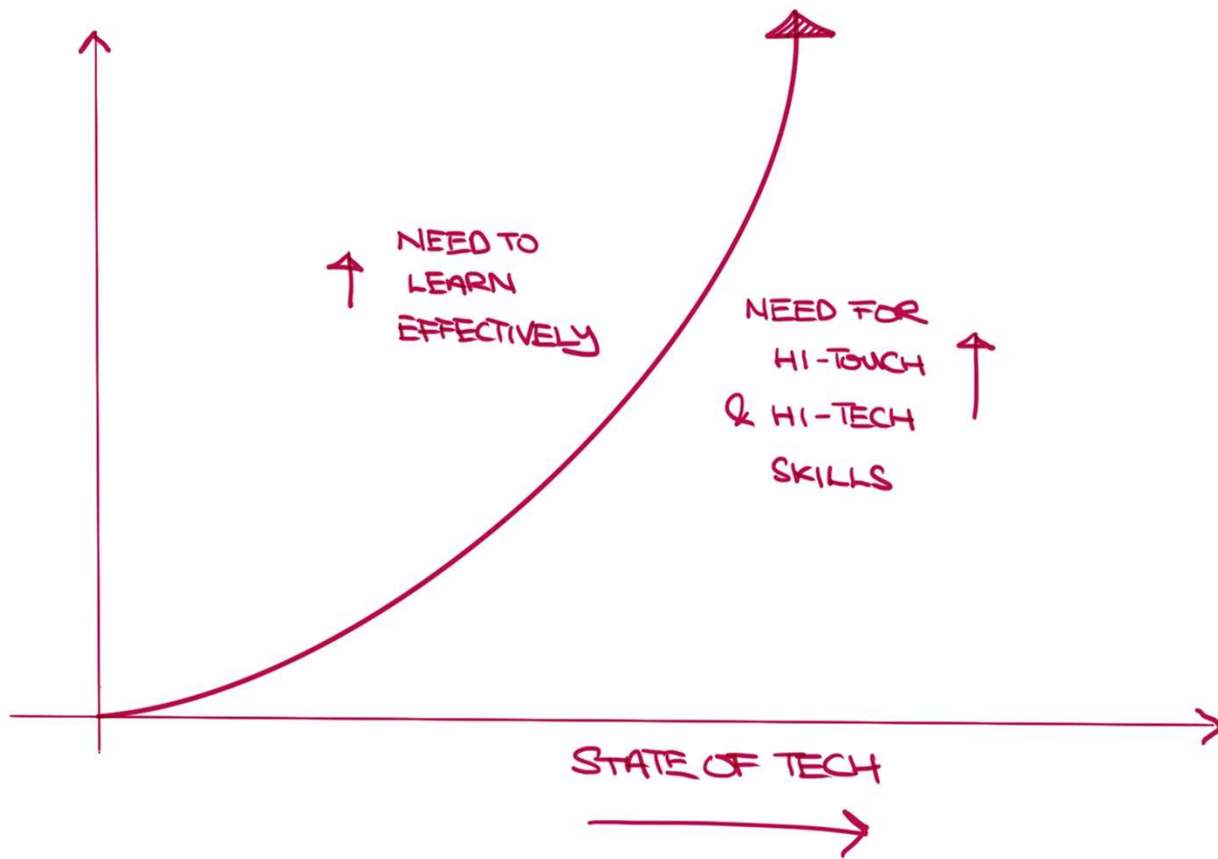
Learning to Learn
in this New Age

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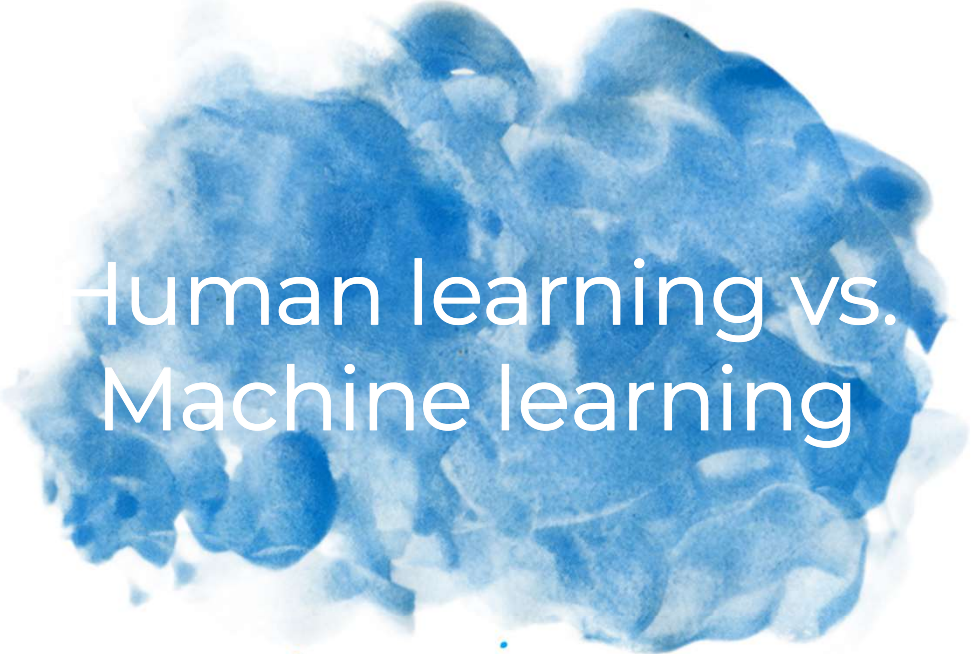
A word cloud illustrating the future of work. The most prominent words are 'automation', 'future of work', 'AI', 'work', 'skills', 'business', 'technology', 'new', 'workplace', 'learning', and 'people'. Other significant terms include 'digital', 'workforce', 'employees', 'jobs', 'innovation', 'management', 'talent', 'challenges', 'impact', 'working', 'nov', 'already', 'create', 'upskilling', 'free', 'digital transformation', 'machine learning', 'survey', 'gen', 'management', 'employee', 'hear', 'upskilling', 'already', 'create', 'upskilling', 'free', 'digital transformation', 'machine learning', 'survey', 'gen', 'management', 'employee', 'hear', 'upskilling', 'already', 'create', 'upskilling', 'free', 'digital transformation', 'machine learning', 'survey', 'gen'. The words are arranged in a roughly circular shape with varying font sizes and colors, primarily in shades of pink, red, and black.





The image features a large, irregular watercolor splash in shades of blue and white, centered in the upper half. Below this splash, a horizontal band of small, scattered blue dots and splatters extends across the width of the image. The background is plain white.

Still Learning to Learn



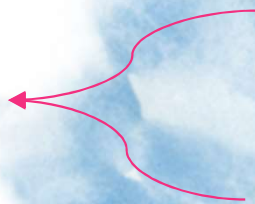
Human learning vs. Machine learning



Max-Neef's fundamental human needs -

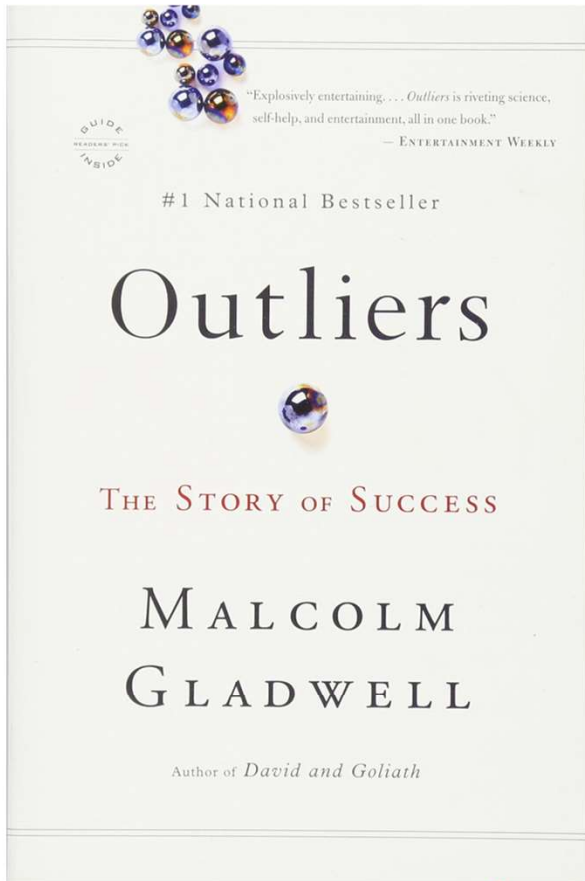
- subsistence
- protection
- affection
- **understanding**
- participation
- recreation
- **creation**
- identity
- freedom

Innate
need to
learn





Book Reviews

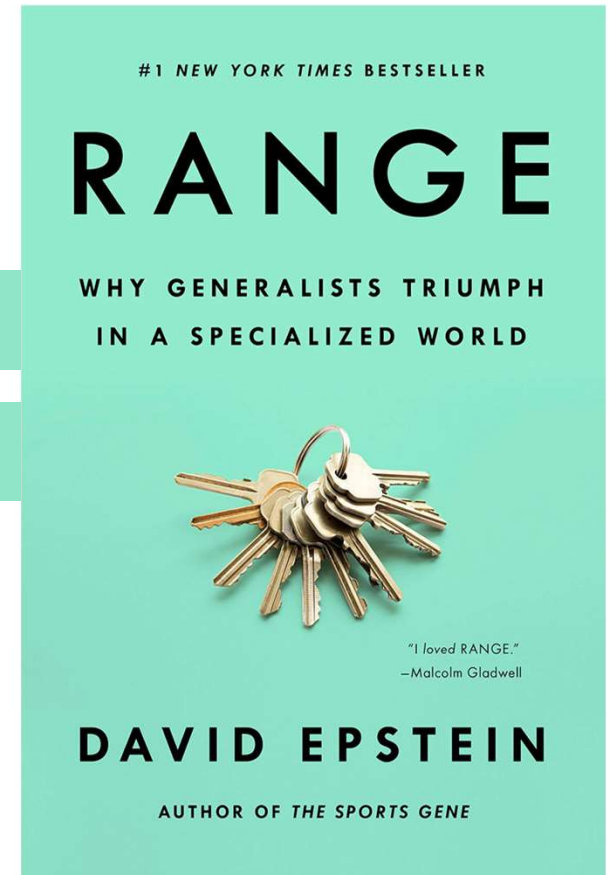


All domains - 10,000 hrs

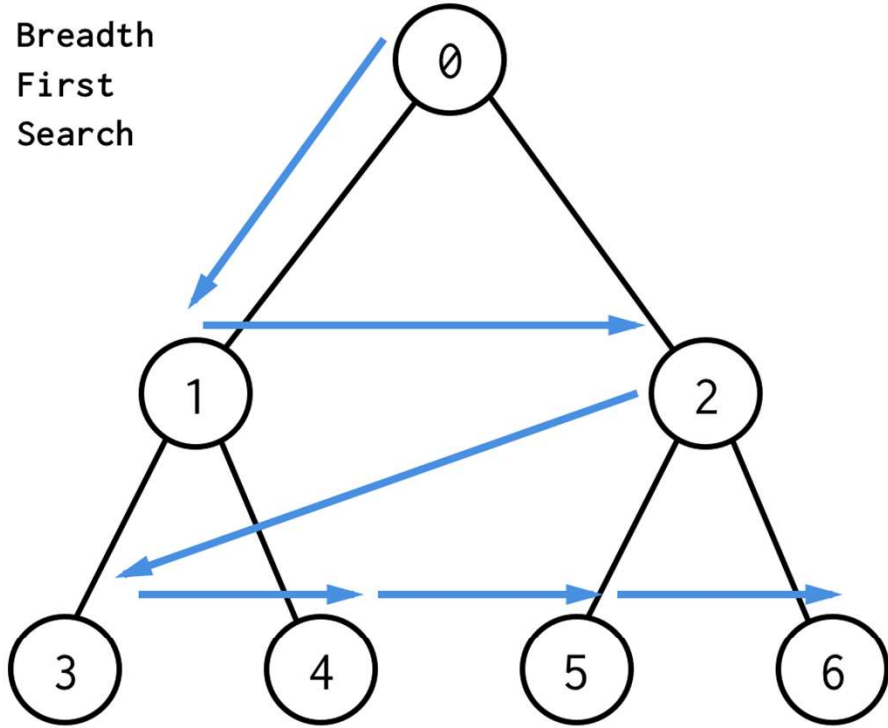
Depth first search

Kind vs. wicked domains

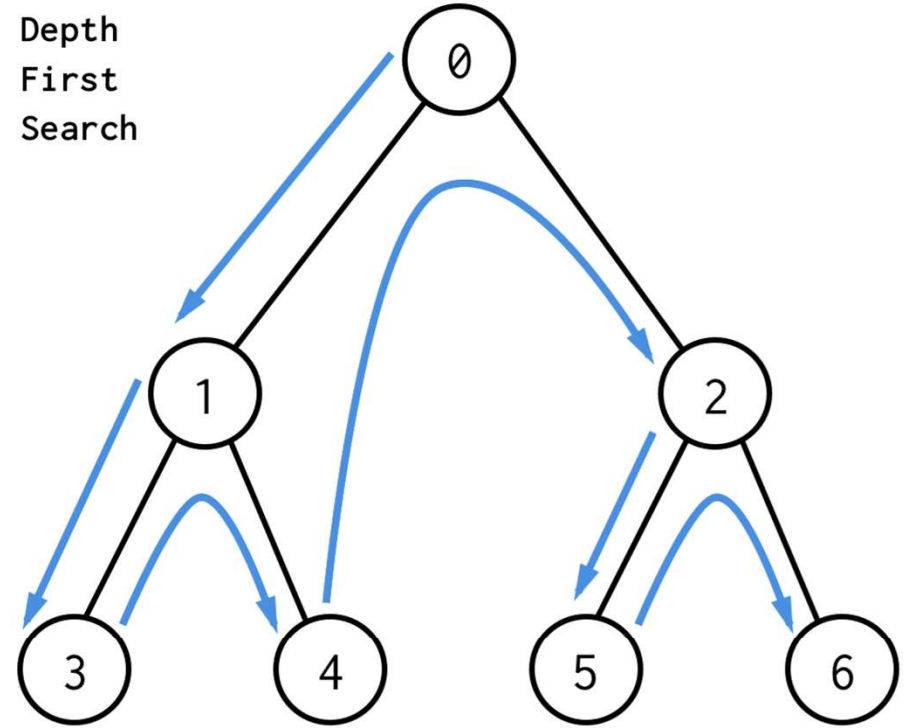
Breadth first search

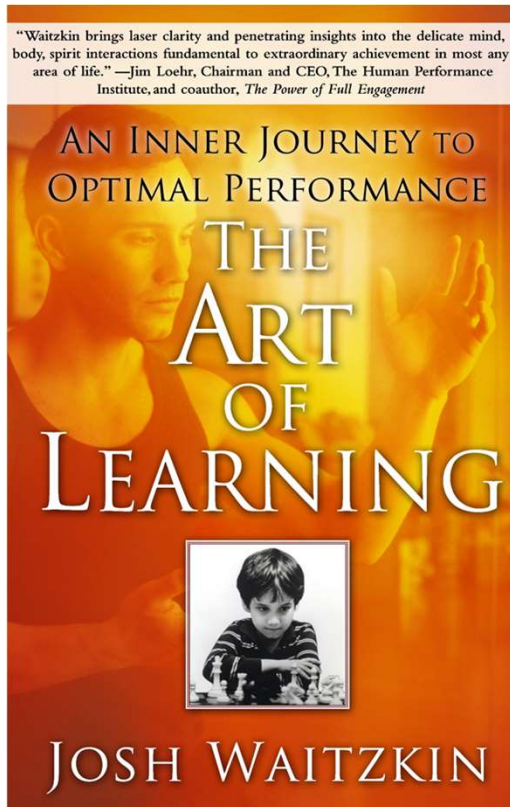


Breadth
First
Search



Depth
First
Search





- *Chess grandmaster, Tai Chi Chuan champion, Brazilian Jiu Jitsu black belt*
- **Making Small Circles** - Expand outward from the fundamentals
- **Slowing Down Time** - Master the details til time slows down when you have to react
- **Numbers to Leave Numbers** - skill level as levels in a pyramid, to break the rules, you must first learn the rules
- **Carving Neural Pathways** - identifying patterns in chunks of information for efficient retrieval and understanding

"A good teacher will leave you educated. But a great teacher will leave you curious. Well, Barbara Oakley is a great teacher. Not only does she have a mind for numbers, she has a way with words, and she makes every one of them count."

—Mike Rowe, creator and host of Discovery Channel's *Dirty Jobs* and CEO of *inkretiveWORKS*

$a \left(\frac{\text{MIND}}{\text{for}} \right) =$ NUMBERS



A Companion to
COURSEERA®'s
popular online
course *Learning
How to Learn*

HOW TO EXCEL AT
MATH AND SCIENCE

(Even if You Flunked Algebra)

BARBARA OAKLEY, Ph.D.

- *Linguist turned engineering PHD turned neuroscience researcher*
- **Math & science can be mastered by anyone**
- **Chunking again** - Building up from conceptual chunks
- **Alternating between diffused and focused modes** - counter-productive sometimes to always be in one mode
- **Illusions of Confidence** - seeing the answer vs. working it out yourself

NEW YORK TIMES BESTSELLER

MOONWALKING



WITH



EINSTEIN

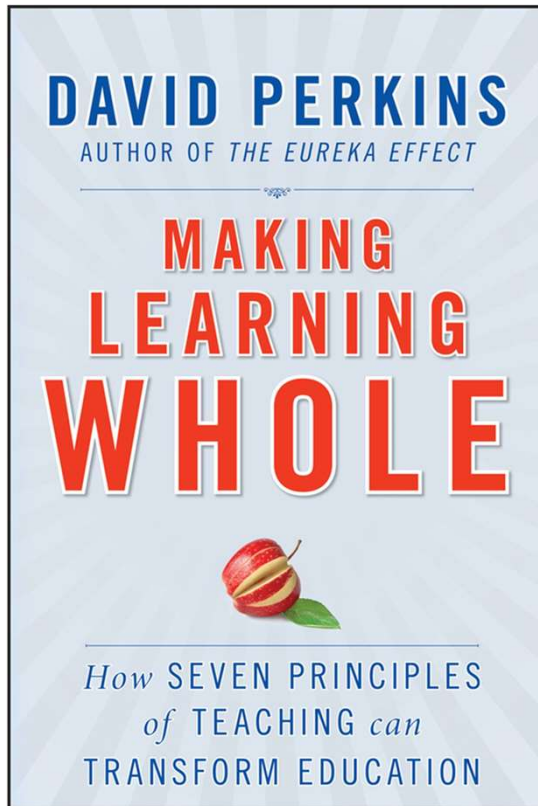


The Art and Science of Remembering Everything

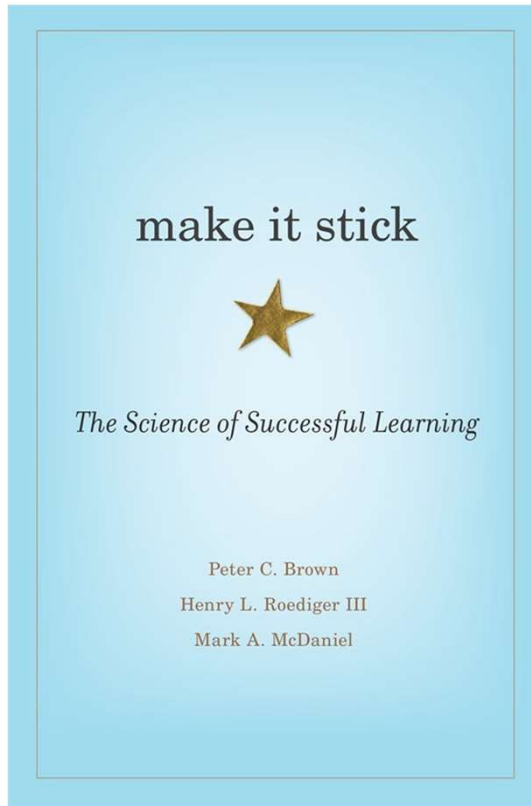
JOSHUA FOER




- *Documents the fascinating journey of a journalist who dived into the competitive world of memory championships and became US champion & record breaker within a year*
- **Purposeful practice**
- **Anything can be learned with enough repetition (chunking)**
- **Anything can be learned more quickly with actual practice**
- **Exploit our ability to remember novel & visual things**
- **Memory palaces, method of loci, designing encoding systems**



- *Harvard professor and director of Project Zero, known for work on multiple intelligences*
- **7 Principles of Teaching**
 1. Play the whole game - top down, don't get 'elementitis'
 2. Make the game worth playing - intrinsic motivation
 3. Work on hard parts
 4. Play outside comfort zone
 5. Play the hidden game - get into the underlying 'why'
 6. Learn from the team - peers
 7. Learn to learn




- *1 writer + 2 cognitive scientists*
- **Learning -**
 - requires memory
 - is better when effortful
 - is lifelong
- **Practice should -**
 - be deliberate
 - be spaced out
 - vary and interleaved
 - involve retrieval from memory
- **Effective learning entails -**
 - Having a foundation of knowledge
 - Knowing the context
 - Building mental models and using mental cues




Personal
takeaways
for learning
technical stuff



Fixed
vs.
Growth
Mindset?



Anything can
be learnt



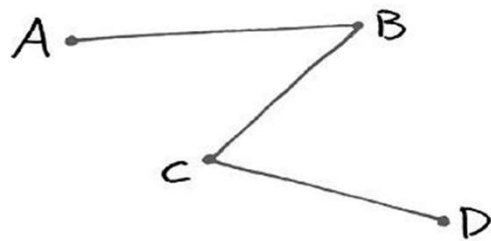
Get comfortable
with
non-linear
learning

Fox

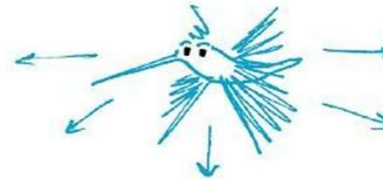


- ✓ Linear
- ✓ Clever
- ✓ Analyzing
- ✓ A little self-satisfied

Our verbal mind.

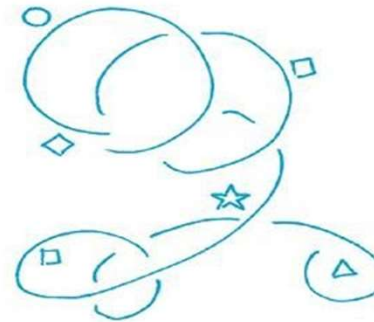


Hummingbird



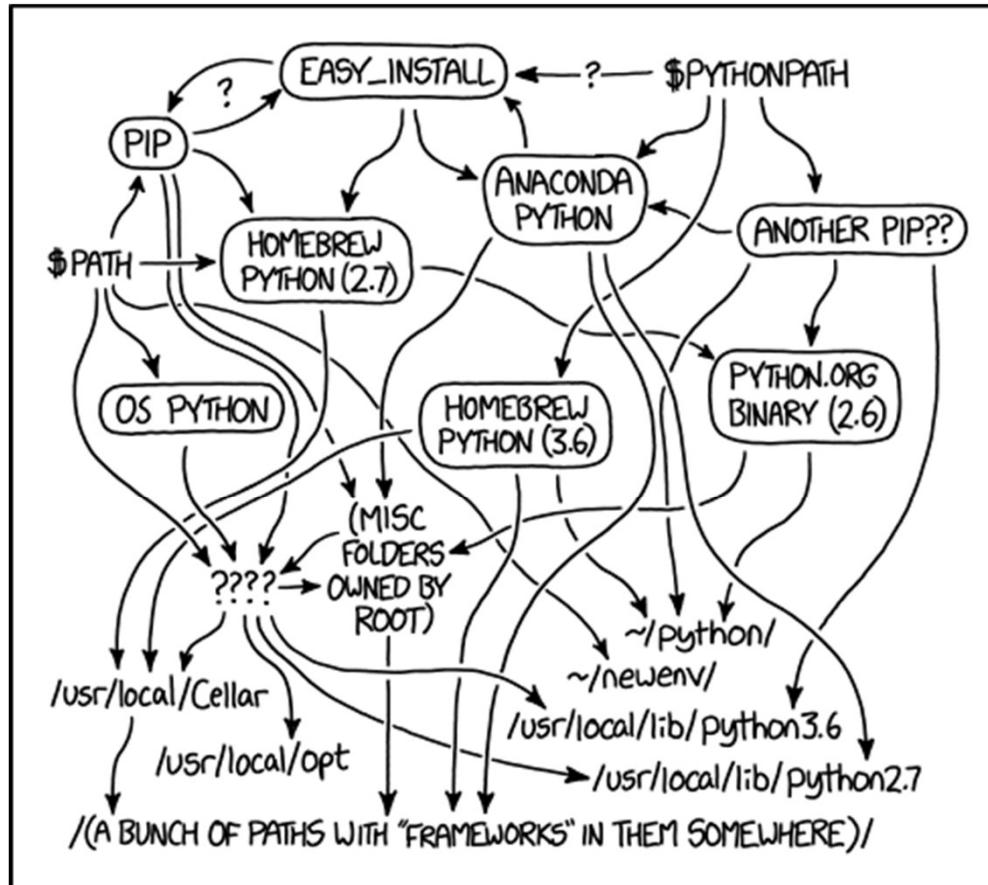
- ✓ Spatial
- ✓ Spontaneous
- ✓ Synthesizing
- ✓ A little flighty + forgetful

Our visual mind.





Get comfortable
with
messiness



MY PYTHON ENVIRONMENT HAS BECOME SO DEGRADED
 THAT MY LAPTOP HAS BEEN DECLARED A SUPERFUND SITE.



But start
from
first principles




First, why?



Then, how?





Going beyond the
generalist &
specialist
divide?

A continuum?



'dash'

'l'

'T'

'Banyan tree'

BREADTH

DEPTH

BREADTH

DEPTH

DEPTH

DEPTH

DEPTH


DEPTH

DEPTH


DEPTH

DEPTH



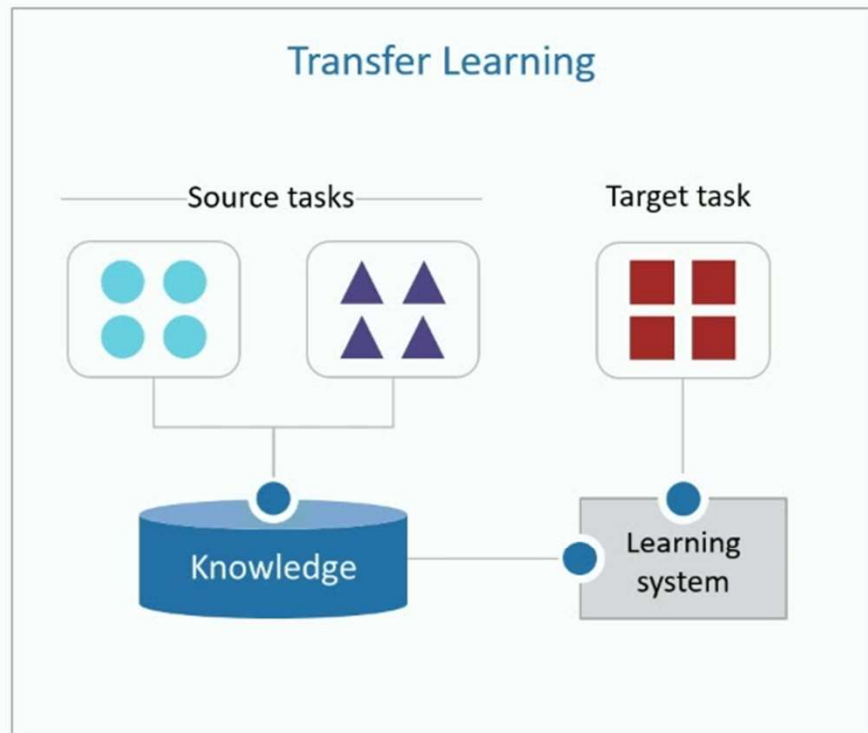
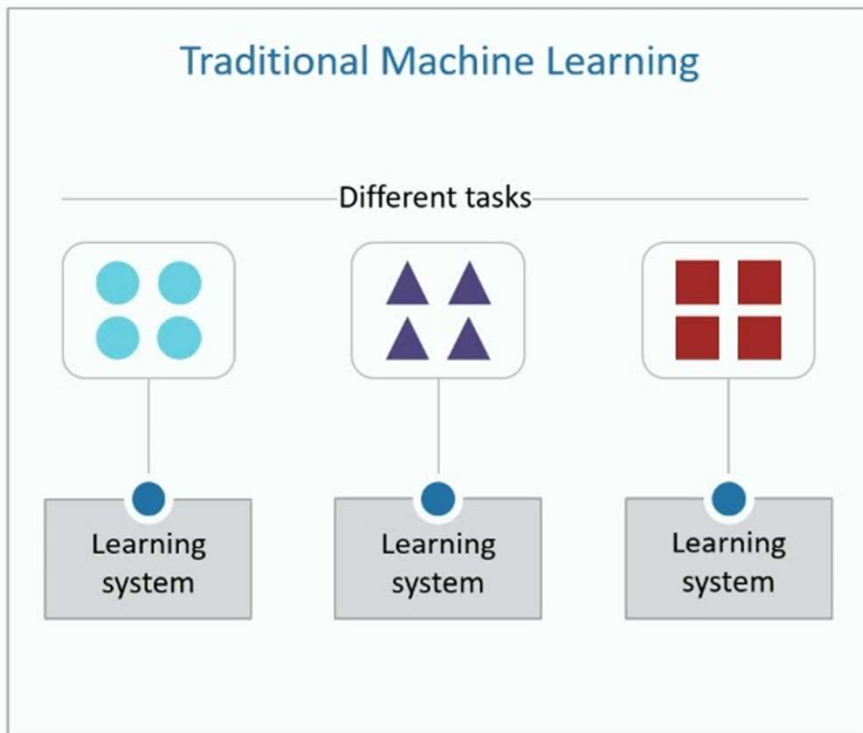


We already
know many things
that we need

A circular splash of blue watercolor paint with irregular, feathered edges, centered on a white background. The text is overlaid on the darker, central part of the splash.

Nothing we learn is
wasted -
transfer learning

Traditional versus Transfer learning





Read

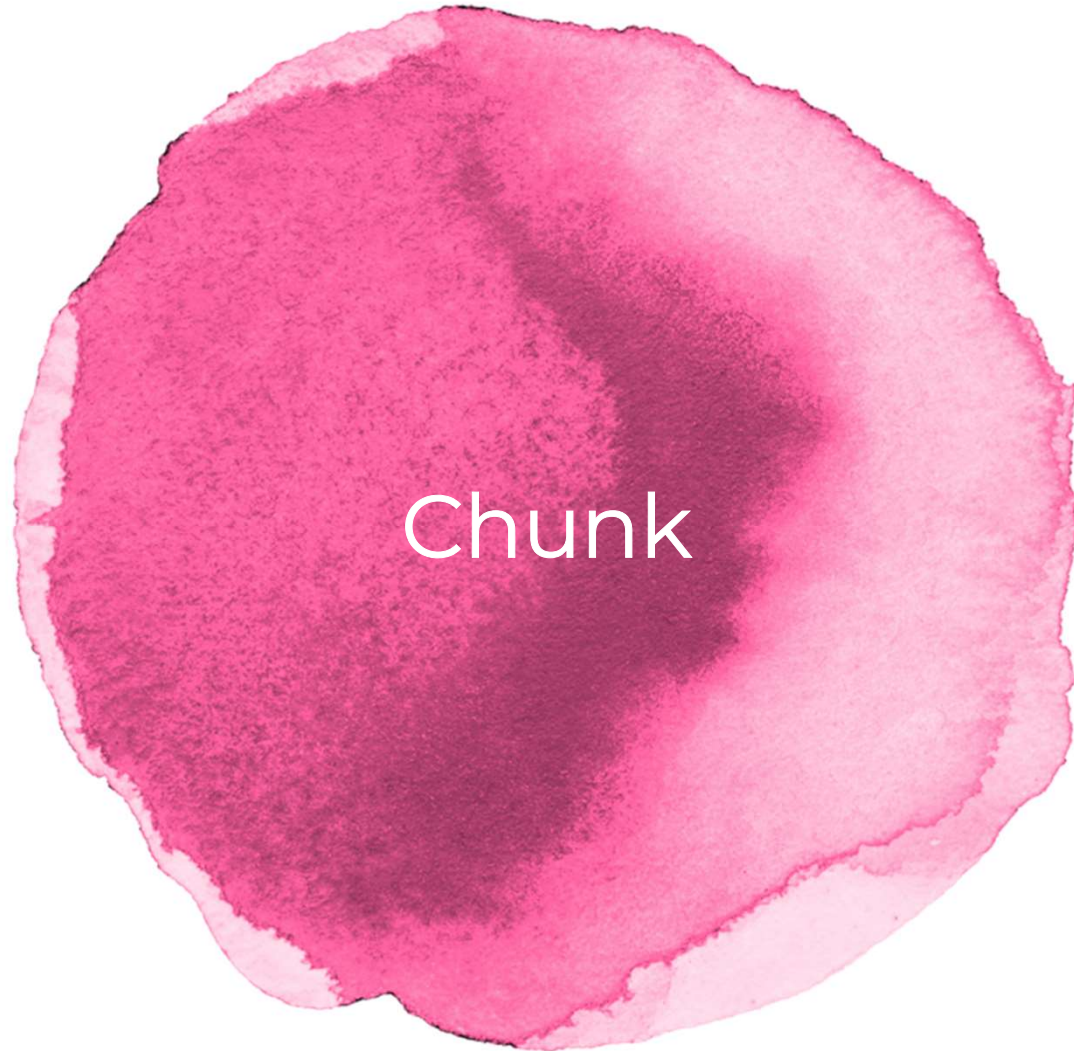
Do

Listen

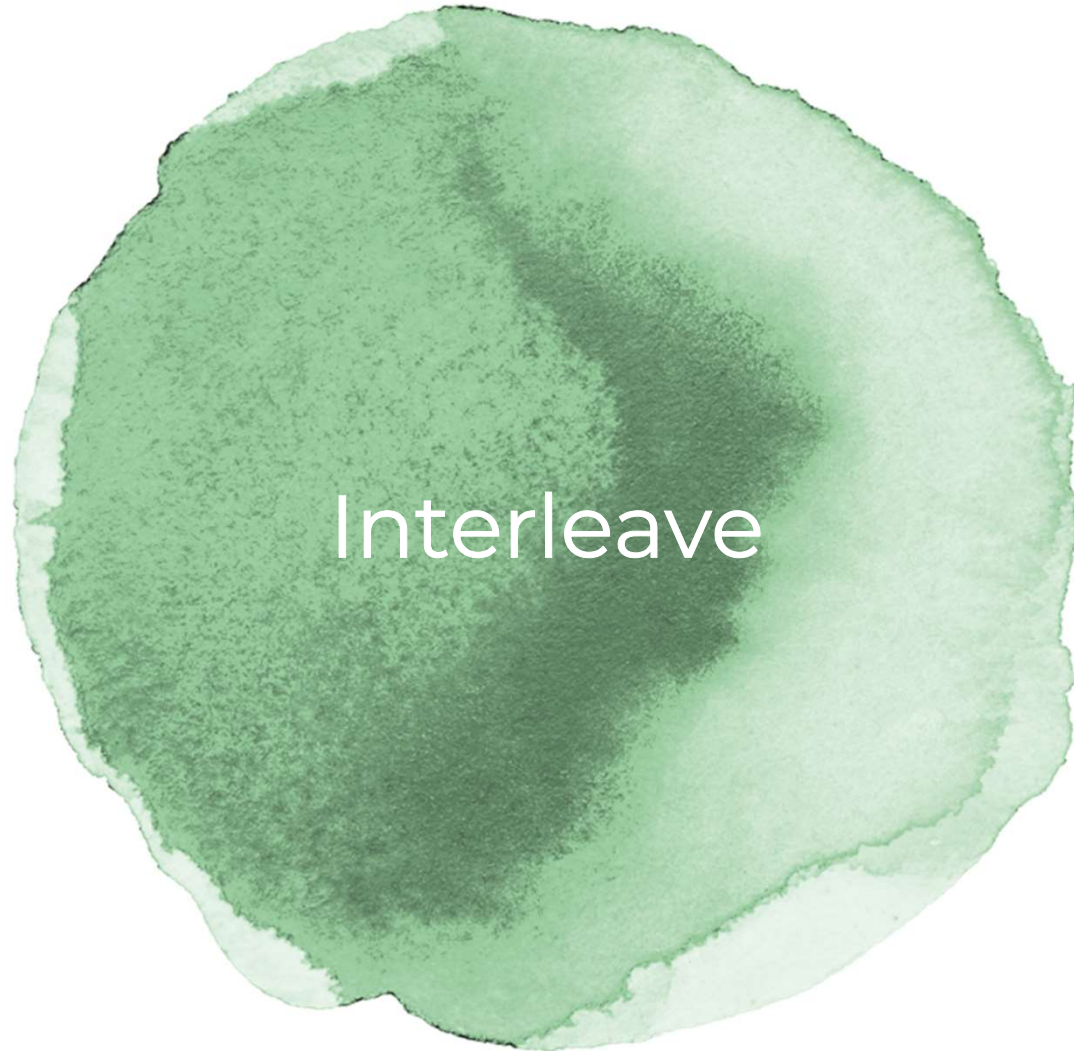
Do

Rinse

Repeat



Chunk



Interleave



Practice in a
deliberate manner



Thank you