0:00
[Music]
0:05
ever since computers were invented
0:07
they've really just been glorified
0:08
calculators machines that execute the
0:11
exact instructions given to them by the
0:13
programmers but something incredible is
0:15
happening now computers have started
0:16
gaining the ability to learn and think
0:19
and communicate just like we do they can
0:21
do creative intellectual work that
0:23
previously only humans could do we call
0:25
this technology generative Ai and you
0:27
may have encountered it already through
0:29
products like GPT basically intelligence
0:32
is now available as a service kind of
0:34
like a giant brain floating in the sky
0:36
that anyone can talk to it's not perfect
0:39
but it is surprisingly capable and it is
0:40
improving at an exponential rate this is
0:43
a big deal it's going to affect just

0:45
about every person and Company on the
0:47
planet positively or negatively this
0:49
video is here to help you understand
0:51
what generative AI is all about in
0:53
Practical terms beyond the hype the
0:54
better you understand this technology as
0:56
a person team or company the better
0:58
equipped you will be to survive and
1:00
thrive in the age of AI so here's a
Einstein in your basement
1:03
silly but useful mental model for this
1:05
you have Einstein in your basement in
1:07
fact everyone does and by Einstein I
1:10
really mean the combination of every
1:12
smart person who ever lived you can talk
1:14
to Einstein whenever you want he has
1:16
instant access to the sum of all human
1:18
knowledge and will answer anything you
1:20
want within seconds never running out of
1:21
patience he can also take on any role
1:23

you want a comedian poet doctor coach
1:27
and will be an expert within that field
1:29
he has some human-like limitations
1:31
though he can make mistakes he can jump
1:33
to conclusions he can misunderstand you
1:35
but the biggest limitation is actually
1:37
your imagination and your ability to
1:39
communicate effectively with them this
1:41
skill is known as prompt engineering and
1:43
in the age of AI this is as essential as
1:46
reading and writing most people vastly
1:49
underestimate what this Einstein in your
1:51
basement can do it's like going to the
1:53
real Einstein and asking him to proof
1:55
read a high school report or hiring a
1:56
worldclass five-star chef and having him
1:59
chop onion the more you interact with
2:01
Einstein the more you will discover
2:02
surprising and Powerful ways for him to
2:04
help you or your company okay enough
What is AI

2:07
fluffy metaphors let's clarify some
2:08
terms AI as you probably know stands for
2:11
artificial intelligence AI is not new FS
2:14
like machine learning and computer
2:15
vision have been around for decades
2:17
whenever you see a YouTube
2:18
recommendation or a web search result or
2:21
whenever you get a credit card
2:22
transaction approved that's traditional
2:24
AI in action generative AI is AI that
2:27
generates new original content rather
2:29
than just finding or classifying
2:30
existing content that's the G in GPT for
2:33
example large language models or llms
2:36
are a type of generative AI that can
2:38
communicate using normal human language
2:41
chat GPT is a product by the company
2:43
open AI it started as an llm essentially
2:46
an advanced chatbot using a new
2:47
architecture called the Transformer

2:49
architecture which by the way is the T
2:51
in GPT it is so fluent at human language
2:54
that anyone can use it you don't need to
2:55
be an AI expert or programmer and that's
2:57
kind of what triggered the whole
2:58
Revolution so how does it actually work
How does it work
3:02
well a large language model is an
3:03
artificial neural network basically a
3:06
bunch of numbers or or parameters
3:08
connected to each other similar to how
3:09
our brain is a bunch of neurons or brain
3:11
cells connected to each other neural
3:12
networks only deal with numbers you send
3:15
in numbers and depending on how the
3:16
parameters are set all the numbers come
3:18
out but any kind of content such as text
3:20
or images can be represented as numbers
3:22
so let's say I write dogs are when I
3:25
send that to a large language model that
3:27

gets converted to numbers processed by
3:29
the neural network and then the
3:30
resulting numbers are converted back
3:31
into text in this case the word animals
3:34
dogs are animals so yeah this is
3:36
basically a guest to next word machine
3:39
the interesting part is if we take that
3:41
output and combine it with the input and
3:43
send it through the model again then it
3:45
will continue adding new words that's
3:46
what's going on behind the scenes when
3:48
you type something in chat GPT in this
3:50
case for example it generated a whole
3:51
story and I can continue this
3:53
indefinitely by adding more
3:55
prompts a large language model may have
3:58
billions or even trillions of of
3:59
parameters that's why they're called
4:01
large so how are all these numbers set
Training
4:04
well not through manual programming that

4:06
would be impossible but through training
4:09
just like babies learning to speak a
4:10
baby isn't told how to speak she doesn't
4:13
get an instruction manual instead she
4:15
listens to people speaking around her
4:16
and when she's heard enough she starts
4:18
seeing the pattern she speaks a few
4:20
words at first to the Delight of her
4:21
parents and then later on full sentences
4:24
similarly during a training period the
4:26
language model is fed a mindboggling
4:28
amount of text to learn from Mostly from
4:31
internet sources it then plays guess the
4:33
next word with all of this over and over
4:35
again and the parameters are
4:37
automatically tweaked until it starts
4:38
getting really good at predicting the
4:40
next word this is called back
4:41
propagation which is a fancy term for oh
4:44
I guessed wrong I better change

4:45
something however to become truly useful
4:47
a model also needs to undergo human
4:49
training this is called reinforcement
4:51
learning with human feedback and it
4:53
involves thousands of hours of humans
4:55
painstakingly testing and evaluating
4:57
output from the model and giving
4:58
feedback kind of like training a a dog
5:01
with a clicker to reinforce good
5:02
behavior that's why a model like GPT
5:04
won't tell you how to rob a bank it
5:06
knows very well how to rob a bank but
5:08
through human training it has learned
5:09
that it shouldn't help people commit
5:11
crimes when training is done the model
5:13
is mostly Frozen other than some fine
5:15
tuning that can happen later that's what
5:17
the P stands for in GPT pre-trained
5:19
although in the future we will probably
5:20
have models that can learn continuously

5:22
rather than just uh during training and
5:24
fine-tuning now although chat GPT kind
Models
5:26
of got the ball rolling GPT isn't the
5:29
only model out there in fact new models
5:31
are sprouting like
5:32
mushrooms they vary a lot in terms of
5:34
speed capability and cost some can be
5:37
downloaded and run locally others are
5:38
only online some are free or open source
5:41
others are commercial products some are
5:43
super easy to use While others require
5:45
complicated technical setup some are
5:47
specialized for certain use cases others
5:50
are more General and can be used for
5:51
almost anything and some are baked into
5:54
products in the form of co-pilots or or
5:56
chat windows it's it's the Wild West
6:00
just keep in mind that you generally get
6:01
what you pay for so with a free model
6:04

you may just be getting a smart high
6:06
school student in your basement rather
6:08
than Einstein the difference between for
6:11
example GPT 3.5 and GPT 4 is massive
Different Models
6:15
note that there are different types of
6:17
generative AI models that generate
6:18
different types of content texto text
6:20
models like gpc4 take text as input and
6:23
generate text as output the text can be
6:25
natural language but it can also be
6:27
structured information like code Json
6:29
HTML I use this a lot myself to generate
6:32
code when programming uh it saves an
6:34
incredible amount of time and I also
6:35
learn a lot from the code it generates
6:37
text to image models will generate
6:39
images describe what you want and an
6:41
image gets generated for you you can
6:42
even pick a style image to image models
6:45
can do things like transforming or

6:47
combining images and we have image to
6:50
text models which describe the contents
6:52
of a given image and speech to text
6:54
models create voice transcriptions which
6:56
is useful for things like uh meeting
6:58
notes text Audio models they generate
7:00
music or sounds from a prompt for
7:02
example here is some sound generated
7:04
from The Prompt people talking in a
7:08
busy okay guys enough stop now thank you
7:13
and there are even text to video models
7:15
that generate videos from a prompt
7:17
sooner or later we'll have infinite
7:18
movie series that autog generate the
7:20
next episode tailored to your tastes as
7:22
you're watching kind of scary if you
7:24
think about it one Trend now is
7:26
multimodal AI products meaning they
7:28
combine different models into one
7:30
product so you can work with text images

7:32
audio Etc without switching tools the
7:35
chat GPT mobile app is a good example of
7:37
this just for fun I took a photo of this
7:40
room and I asked where I could hide
7:41
stuff I kind of like that it mentioned
7:44
the stove but warned that that it could
7:46
get hot there when I have things to
7:48
figure out such as the contents of this
7:50
video I like to take walks using chat
7:52
GPT as as a sounding board I start by
7:55
saying always respond with the word okay
7:57
unless I ask you for something that way
7:59
it'll just listen and not interrupt
8:01
after I finish dumping my thoughts I ask
8:03
for feedback we have some discussion and
8:06
then I ask it to summarize and text
8:07
afterwards I really recommend trying
8:09
this it's it's a really useful way to
8:11
use tools like this turns out Einstein
8:13
isn't stuck in the basement after all

8:15
you can take him out for a walk
8:17
initially language models were just word
8:19
predictors statistical machines with
8:22
limited practical use but as they became
8:24
larger and were trained on more data
8:26
they started gaining emergent
8:28
capabilities expected capabilities that
8:30
surprised even the developers of the
8:31
technology they could roleplay write
8:34
poetry write high quality code discuss
8:36
company strategy provide legal and
8:38
medical advice coach teach basically
8:41
creative and intellectual things that
8:43
only humans could do previously it turns
8:45
out that when a model has seen enough
8:47
text and images it starts to see
8:49
patterns and understand higher level
8:51
Concepts just like a baby learning to
8:53
understand the world let's take a simple
8:55
example I'll give gpc4 this little

8:57
drawing that involves a string a pair of
9:00
scissors an egg a pot and a fire what
9:03
will happen if I use the scissors the
9:05
model has most likely not been trained
9:07
on this exact scenario yet it gave a
9:10
pretty good answer which demonstrates a
9:11
basic understanding of the nature of
9:13
scissors eggs gravity and heat when GPT
9:16
4 was released I started using it as a
9:18
coding assistant and I was blown away
9:20
when prompted effectively it was a
9:22
better programmer than anyone I've
9:23
worked with same with article writing
9:25
product design Workshop planning and
9:27
just about anything I used it for for
9:29
the main bottleneck was my prompt
9:32
engineering skills so I decided to make
9:33
a career shift and focus entirely on
9:35
learning and teaching how to make this
9:37
technology useful hence this video now

9:40
let's take a step back and look at the
9:41
implications for 300,000 years or so we
9:44
homosapiens have been the most
9:46
intelligent species on Earth depending
9:48
of course on how you define intelligence
9:50
but the thing is our intellectual
9:51
capabilities aren't really improving
9:53
that much our brains are about the same
9:55
size same weight as they've been for
9:56
thousands of years computers on the
9:58
other hand have been around for only 80
10:00
years or so and now with generative AI
10:02
they are suddenly capable of speaking
10:04
human languages fluently and carrying
10:06
out an increasing number of intellectual
10:08
creative tasks that previously only
10:10
humans could do so we are right here at
10:12
the Crossing Point where AI is better at
10:14
some things and humans are better at
10:15
some things but ai's capabilities are

10:17
improving at an exponential rate while
10:19
ours aren't we don't know how long that
10:22
exponential Improvement will continue or
10:24
if it will level off at some point but
10:25
we're definitely entering a new world
10:27
order now this isn't the first
10:29
Revolution we've experienced we tamed
10:31
fire we learned how to do agriculture we
10:33
invented the printing press steam power
10:35
Telegraph these were all revolutionary
10:37
changes but they took decades or
10:39
centuries to become widespread in the AI
10:42
Revolution new technology spreads
10:44
worldwide almost instantly dealing with
10:46
this rate of change is a huge challenge
10:48
for both individuals and
The AI Mindset
10:50
companies I've noticed that people and
10:52
companies tend to fall into different
10:54
kind of mindset categories when it comes
10:56

to AI on one side we have denial the
10:59
belief that AI cannot do my job or we
11:02
don't have time to look into this
11:03
technology this is a dangerous place to
11:05
be a common saying is AI might not take
11:08
your job but people using AI will and
11:11
this is true for both individuals and
11:13
companies on the other side of the scale
11:15
we have panic and despair the belief
11:16
that AI is going to take my job no
11:18
matter what AI is going to make my
11:19
company go bankrupt neither of these
11:21
mindsets are helpful so I propose a
11:24
middle ground a balanced positive
11:26
mindset AI is going to make me my team
11:28
my company insanely productive
11:31
personally with this mindset I feel like
11:33
I've gained superpowers I can go from
11:35
idea to result in so much shorter time I
11:38
can focus more on what I want to achieve
11:40

and less on the grunt workk of building
11:41
things and I'm learning a lot faster too
11:43
it's like having an awesome Mentor with
11:45
me at all times this mindset not only
11:47
feels good but it also equips you for
11:49
the future makes you less likely to lose
11:51
your job or your company and more likely
11:53
to thrive in the age of AI despite all
11:55
the
Is human role needed
11:56
uncertainty so one important question is
11:59
is human role X needed in the age of AI
12:02
for example are doctors needed
12:03
developers lawyers CEOs uh whatever so
12:06
this question becomes more and more
12:08
relevant as the AI capabilities improve
12:11
well some jobs will disappear for sure
12:13
but for most roles I think we humans are
12:15
still needed someone with domain
12:17
knowledge still needs to decide what to
12:19
ask the AI how to formulate The Prompt

12:21
what context needs to be provided and
12:23
how to evaluate the result AI models
12:25
aren't perfect they can be absolutely
12:27
brilliant sometimes but sometimes also
12:30
terribly stupid they can sometimes
12:32
hallucinate and provide bogus
12:33
information in a very convincing way so
12:36
when should you trust the AI response
12:38
when should you double check or do the
12:39
work yourself what about legal
12:41
compliance data security what
12:43
information can we send to an AI model
12:45
and where is that data stored a human
12:48
expert is needed to make these judgment
12:50
calls and compensate for the weaknesses
12:51
of the AI model so I recommend thinking
12:54
of AI as your colleague a genius but
12:56
also an oddball with some personal
12:58
quirks that you need to learn to work
12:59
with you need to recognize when your

13:01
Genius colleague is drunk as a doctor my
13:04
AI colleague can help diagnose rare
13:06
diseases that I didn't even know existed
13:08
as a lawyer my AI colleague could do
13:10
legal research and review contracts
13:12
allowing me to spend more time with my
13:13
client or as a teacher my AI colleague
13:16
could grade tests help generate course
13:18
content provide individual support to
13:20
students Etc and if you're not sure how
13:22
it can help you just ask it I work as X
13:26
how can you help me overall I find that
13:29
the combination of human plus AI That's
13:31
where the magic lies it's important to
Models vs products
13:34
distinguish between the models and the
13:36
products that build on top of them as a
13:38
user you don't normally interact with
13:39
the model directly instead you interact
13:41
with a product website or a mobile app
13:43

which in turn talks to the model behind
13:45
the scenes products provide a user
13:47
interface and add capabilities and data
13:49
that aren't part of the model itself for
13:51
example the chat gpt product keeps track
13:54
of your message history while the GPT 4
13:56
model itself doesn't have any message
13:58
history history as a developer you can
14:00
use these models to build your own AI
14:02
powered products and features for
14:04
example let's say you have an e-learning
14:06
site you could add a chat bot to answer
14:08
questions about the courses or as a
14:10
recruitment company you might build AI
14:12
powered tools to help evaluate
14:13
candidates in both these cases your
14:15
users interact with your product and
14:17
then your product interacts with the
14:18
model this is done via apis or
14:20
application programming interfaces which
14:22

allow your code to talk to the model so
14:24
here's a simple example of using open AI
14:27
API to talk to GP
14:29
not a lot of code needed and here's
14:31
another example of the automatic
14:33
candidate evaluation thing I talked
14:34
about it takes a job description and a
14:37
bunch of CVS in a folder and evaluates
14:39
each candidate automatically and
14:41
incidentally the code itself is mostly
14:43
AI written as a product developer you
14:46
can use AI models kind of like an
14:48
external brain to insert intelligence
14:50
into your product very powerful in order
Prompt engineering
14:54
to use generative AI effectively you
14:56
need to get good at prompt engineering
14:58
or prompt design as I prefer to call it
15:00
this skill is needed both as a user and
15:02
as a product developer because in both
15:04
cases you need to be able to craft

15:06
effective prompts that produce useful
15:08
results from an AI model here's an
15:10
example let's say I want help planning a
15:12
workshop this prompt is unlikely to give
15:15
useful results because no matter how
15:17
smart the AI is if it doesn't know the
15:19
context of my workshop it can only give
15:21
fague high level recommendations the
15:23
second prompt is better now I provided
15:25
some context this is normally done
15:27
iteratively write a prompt look at the
15:29
result add a follow-up prompt to provide
15:31
more information or edit the original
15:33
prompt and rinse and repeat until you
15:35
get a good result in this third approach
15:37
I ask it to interview me so instead of
15:39
me providing a bunch of context up front
15:42
I'm basically saying what do you need to
15:43
know in order order to help me and then
15:45
it will propose a workshop agenda after

15:47
I often combine these two I provide a
15:49
bit of context and then I tell it to ask
15:51
me if it needs any more information
15:53
these are just some examples of prompt
15:54
engineering techniques so overall the
15:57
better you get at prompt engineering the
15:58
faster and better results you will get
16:00
from AI there are plenty of courses
16:02
books videos articles to help you learn
16:04
this but the most important thing is is
16:06
to practice and Learn by doing a nice
16:08
side effect is that you will become
16:09
better at communicating in general since
16:11
prompt engineering is really all about
16:13
Clarity and effective
16:15
communication I think the next Frontier
Autonomous agents
16:17
for generative AI is autonomous agents
16:19
with tools these are AI powerered
16:21
software entities that run on their own
16:23

rather than just sitting around waiting
16:24
for you to prompt them all the time so
16:26
you go down to Einstein in your basement
16:28
and do what a good leader would do for a
16:29
team you give him a high level Mission
16:31
and the tools needed to accomplish it
16:33
and then open the door and let him out
16:35
to run his own show without
16:36
micromanagement the tools could be
16:38
things like access to the internet
16:40
access to money ability to send and
16:42
receive messages order pizza or whatever
16:45
for this prompt engineering becomes even
16:47
more important because your autonomous
16:49
tool wielding agent can do a lot of good
16:51
or a lot of harm depending on how well
16:54
you craft that mission
16:55
statement all right let's wrap it up
16:58
here are the key things I hope you will
17:00
remember from this video generative AI
17:02

is a super useful tool that can help
17:04
both you your team and your company in a
17:06
big way the better you understand it the
17:08
more likely it is to be an opportunity
17:10
rather than a threat generative AI is
17:12
more powerful than you think the biggest
17:14
limitation is not the technology but
17:17
your imagination like what can I do and
17:19
your prompt engineering skills how do I
17:21
do it prompt engineering design is a
17:24
crucial skill like all new skills just
17:27
accept that you will kind of suck at it
17:29
at first but you'll improve over time
17:31
with deliberate practice so my best tip
17:33
is experiment make this part of your
17:36
day-to-day life and the Learning Happens
17:38
automatically hope this video was
17:40
helpful thanks for
17:41
[Music]
17:55
watching