



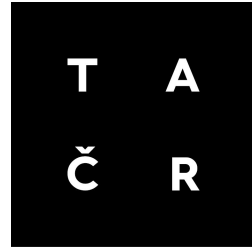
CEEHACKS

DA MU



matfyz

THEAiTRE



THEAiTRE: Automatically generating theatre play scripts



Charles University  
Faculty of Mathematics and Physics  
Institute of Formal and Applied Linguistics



unless otherwise stated



# Motivation

- 25th January 1921
  - R.U.R. by Karel Čapek
  - first theatre play about robots



# Motivation

- 25th January 1921
  - R.U.R. by Karel Čapek
  - first theatre play about robots
- 26th February 2021
  - AI: When a Robot Writes a Play
  - first theatre play written by “robots” (actually AI)

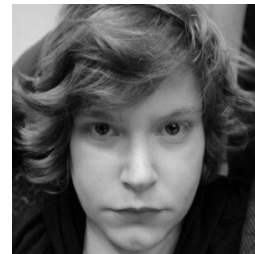


# What is THEaiTRE

- AI to generate theatre play scripts
  - based on GPT-2 language model & CUBBITT translation
- timeline
  - May 2019: first idea
  - Feb 2021: online premiere of 1st play
    - *AI: When a Robot Writes a Play*
    - script: 90% AI, 10% human
    - [on repeats in Švandovo theatre](#)
  - Jun 2022: premiere of 2nd play in New York
    - *Permeation/Prostoupení*
    - script: 90% AI, 10% human
  - Sep 2022: end of project
    - play scripts, codes, models, [demo](#), book
  - 9th Oct 2022: [PLai Prague Cabaret](#)
  - 2023(?): Neural modelling of Czech poetry
  - ...



# Team



# Approach

1. Hacking the GPT-2 language model
- 2.
- 3.
- 4.



# Approach

1. Hacking the GPT-2 language model
2. Building THEaiTRobot
- 3.
- 4.

THEAITRE  Program Éta The project is co-financed with state support of Technological agency of the Czech Republic, Technická agentura ČR, within the Program ETRA.

THEaiTRobot: Scene rur\_epilog

Scene key: rur\_epilog-01a

Radius: Master, the machines will not do the work. We cannot manufacture Robots.

1st Robot: We have striven with all our might. We have obtained a billion tons of coal from the earth. Nine million spiracles are running by day and by night. There is no longer room for all we have made. This we have accomplished in one year.

Alquist: For whom?

Radius: For future generations-so we thought. But we cannot make Robots to follow us. The machines produce only shapeless clods. The skin will not adhere to the bones.

2nd Robot: Eight million Robots have died this year. Within twenty years

1st Robot: Tell us the secret of Life. ✖

2nd Robot: That we must eat, drink, and breathe. ✖ ✖

1st Robot: That we must live in order to live. ✖ ✖

1st Robot: That we must fight or die. ✖ ✖

2nd Robot: That we must make music, dance, sing, dance and sing. ✖ ✖

1st Robot: That we must create, invent, invent. ✖ ✖

2nd Robot: That we must invent, invent, invent. ✖ ✖

1st Robot: That we must create, invent, invent. ✖ ✖

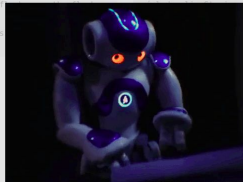
2nd Robot: That we must invent, invent, invent. ✖ ✖

Alquist: But who are you? You are machines, I gather. ✖ ✖

Radius: No, you are wrong. We are just machines. ✖ ✖

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# Approach

1. Hacking the GPT-2 language model
2. Building THEaiTRobot
3. Generating a theatre play script
- 4.

THEAITRE  Program Éta The project is co-financed with state support of Technological Agency of the Czech Republic, Technological Agency CZ, within the Program 27A2.

THEaiTRobot: Scene rur\_epilog

Scene key: rur\_epilog-01a

Radius: Master, the machines will not do the work. We cannot manufacture Robots.

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2nd Robot: Eight million Robots have died this year. Within twenty years...

1st Robot: Tell us the secret of life.

2nd Robot: That we must eat, drink, and breathe. X ✖

1st Robot: That we must live in order to live. X ✖

1st Robot: That we must fight or die. X ✖

2nd Robot: That we must make music, dance, sing, dance and sing. X ✖

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Alquist: But who are you? You are machines, I gather. X ✖

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[Continue this dialogue](#)

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# Approach

1. Hacking the GPT-2 language model
2. Building THEaiTRobot
3. Generating a theatre play script
4. Performing the play on stage

THEAITRE Program Éta The project is co-financed with state support of Technological Agency of the Czech Republic, Technological Agency CZU within the Program 27/21.

THEaiTRobot: Scene rur\_epilog

Scene key: rur\_epilog31a

Radius: Master, the machines will not do the work. We cannot manufacture Robots.

1st Robot: We have striven with all our might. We have obtained a billion tons of coal from the earth. Nine million spiders are running by day and by night. There is no longer room for all we have made. This we have accomplished in one year.

Alquist: For whom?

Radius: For future generations-so we thought. But we cannot make Robots to follow us. The machines produce only shapeless clods. The skin will not adhere to the bones.

2nd Robot: Eight million Robots have died this year. Within twenty years...

1st Robot: Tell us the secret of life.

2nd Robot: That we must eat, drink, and breathe. X \*

1st Robot: That we must live in order to live. X \*

1st Robot: That we must fight or die. X \*

2nd Robot: That we must make music, dance, sing, dance and sing. X \*

1st Robot: That we must create, invent, invent. X \*

2nd Robot: That we must invent, invent, invent. X \*

1st Robot: That we must create, invent, invent. X \*

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Alquist: But who are you? You are machines, I gather. X \*

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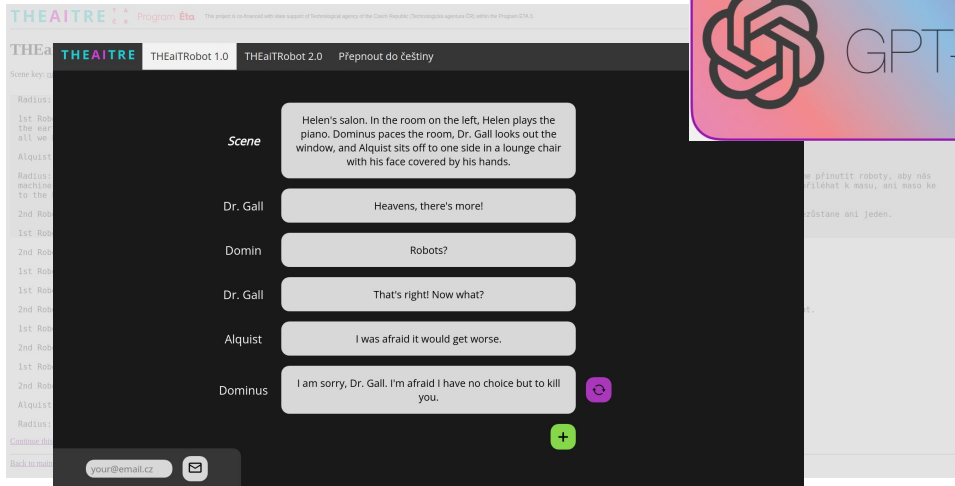
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# Approach

1. Hacking the GPT-2 language model
2. Building THEaiTRobot
3. Generating a theatre play script
4. Performing the play on stage
5. Online demo



# Hacking the GPT-2 Language Model



GPT-2  
SMALL

117M Parameters



GPT-2  
MEDIUM

345M Parameters



GPT-2  
LARGE

762M Parameters



GPT-2  
EXTRA  
LARGE

1,542M Parameters



# Language model

# Language model

- Task: Which word should follow?

# Language model

- Task: Which word should follow?
  - I woke up in the morning and went to the...
    - ???

# Language model

- Task: Which word should follow?
  - I woke up in the morning and went to the...
    - kitchen
    - bathroom
    - cinema
    - horse



# Language model

- Task: Which word should follow?
  - I woke up in the morning and went to the... kitchen/bathroom/cinema/horse
- Language model
  - “Learns” a language from large texts (billions of words)
    - news, books, websites, film subtitles...

# Language model

- Task: Which word should follow?
  - I woke up in the morning and went to the... kitchen/bathroom/cinema/horse
- Language model
  - “Learns” a language from large texts (billions of words)
    - news, books, websites, film subtitles...
- Basic language model
  - How often are words A B C followed by word **D** (in first 100M lines of Wikipedia)?
    - “went to the bathroom” > “went to the horse”?
    - “went to the cinema” > “went to the kitchen”?

# Language model

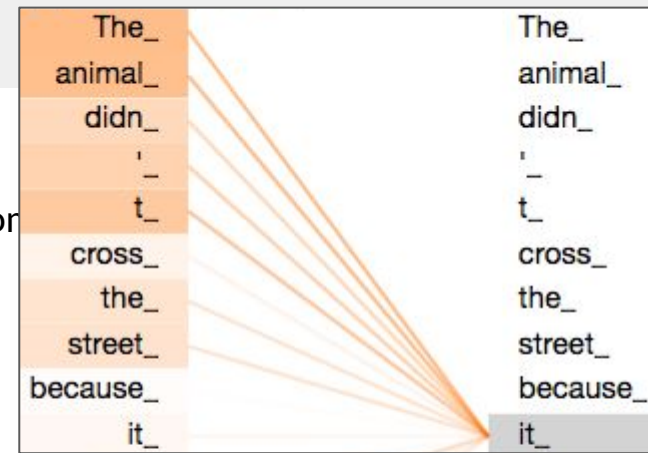
- Task: Which word should follow?
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- Basic language model
  - How often are words A B C followed by word **D** (in first 100M lines of Wikipedia)?
    - “went to the bathroom” > “went to the horse”? 42 > 4
    - “went to the cinema” > “went to the kitchen”?

# Language model

- Task: Which word should follow?
  - I woke up in the morning and went to the... kitchen/bathroom/cinema/horse
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    - “went to the cinema” > “went to the kitchen”? 25 > 14

# Language model

- Task: Which word should follow?
  - I woke up in the morning and went to the... kitchen/bathroom
- Language model
  - “Learns” a language from large texts (billions of words)
    - news, books, websites, film subtitles...
- Basic language model
  - How often are words A B C followed by word **D** (in first 100M lines of Wikipedia)?
    - “went to the bathroom” > “went to the horse”? 42 > 4
    - “went to the cinema” > “went to the kitchen”? 25 > 14
- Neural language models (specifically GPT-2)
  - deep neural networks (transformer self-attention, word embeddings)
  - soft (continuous) word representations, meaning similarity (vector cosine similarity)
  - larger previous context (1024 tokens), soft/gapped attention to context (soft conditioning)
  - trained for next word prediction (8 million articles from internet)



# Language model limitations

- **Based on available data**
  - good: news (frequent)
  - bad: Amy Winehouse song lyrics (rare, only 40 exist)
  - bad: police interrogations (mostly unavailable)
- **Limited context**
  - good: short texts (a few paragraphs)
  - bad: long texts (more than one page)
- **Based only on text**
  - lacks real-world experience
  - lacks other channels
  - contradictions, nonsense
  - theatre play: as a playwright who never has never been to a theatre
- **We used GPT-2 (released in 2019)**
  - GPT-3 and other newer models much more powerful
  - but unavailable when the project started
  - and GPT-3 not available for retraining/adpating/fine-tuning

A blue and white humanoid robot with glowing orange eyes and a blue crest on its chest, standing in a dark environment. The robot has a blue crest on its head and a blue circular emblem on its chest. It is standing on a blue surface.

**THEaiTRobot**

- Use a theatre-script-like prompt as input, e.g.:

*A man is driving in his car. He sees a girl hitchhiking next to the road. He stops the car.*

*Man: Do you want a ride?*

*Girl: Oh yes please!*

- Take GPT-2 XL language model
- Let it generate a continuation (word by word, line by line...)
- Machine translation English→Czech
  - CUBBITT by Martin Popel ([translate.cuni.cz](https://translate.cuni.cz))



## A sample output

*A man is driving in his car. He sees a girl hitchhiking next to the road. He stops the car.*

*Man: Do you want a ride?*

*Girl: Oh yes please!*

*Man: Okay, then you must first convince me you're not a child prostitute.*

*Girl: I'm 16 years old, and I'm only 16.*

*Man: Then I'll take you home!*

*Woman: He's asking for trouble!*

*Man: No, he's only asking!*

*Woman: Then why don't you just take her home already?*

*Man: But I have a family!*

BOY

Please tell me a joke\_

Output Examples



BOY  
Please tell me a joke!

ROBOT  
Okay\_

## Input

Robot wakes up from his dream about electronic sheeps to find out that there is woman standing above him trying to steal his shiny mechanic arm.

Robot: What the hell you think you are doing?

Woman: I am sorry! I need that arm for my leprous child.

## Output

Robot: What child?

Woman: My daughter. I was very afraid of her when you came with me.

Robot: You should not be. Your daughter has been kidnapped by a bunch of evil robots and now she's in danger.

Woman: You do not understand. I am sorry. I do not wish to see your daughter's face again.

Robot: You are my daughter!

Woman: I do not know your name. Please, tell me yours!

Robot: Your name is Robot. Robot. Robot. Robots. Robot.

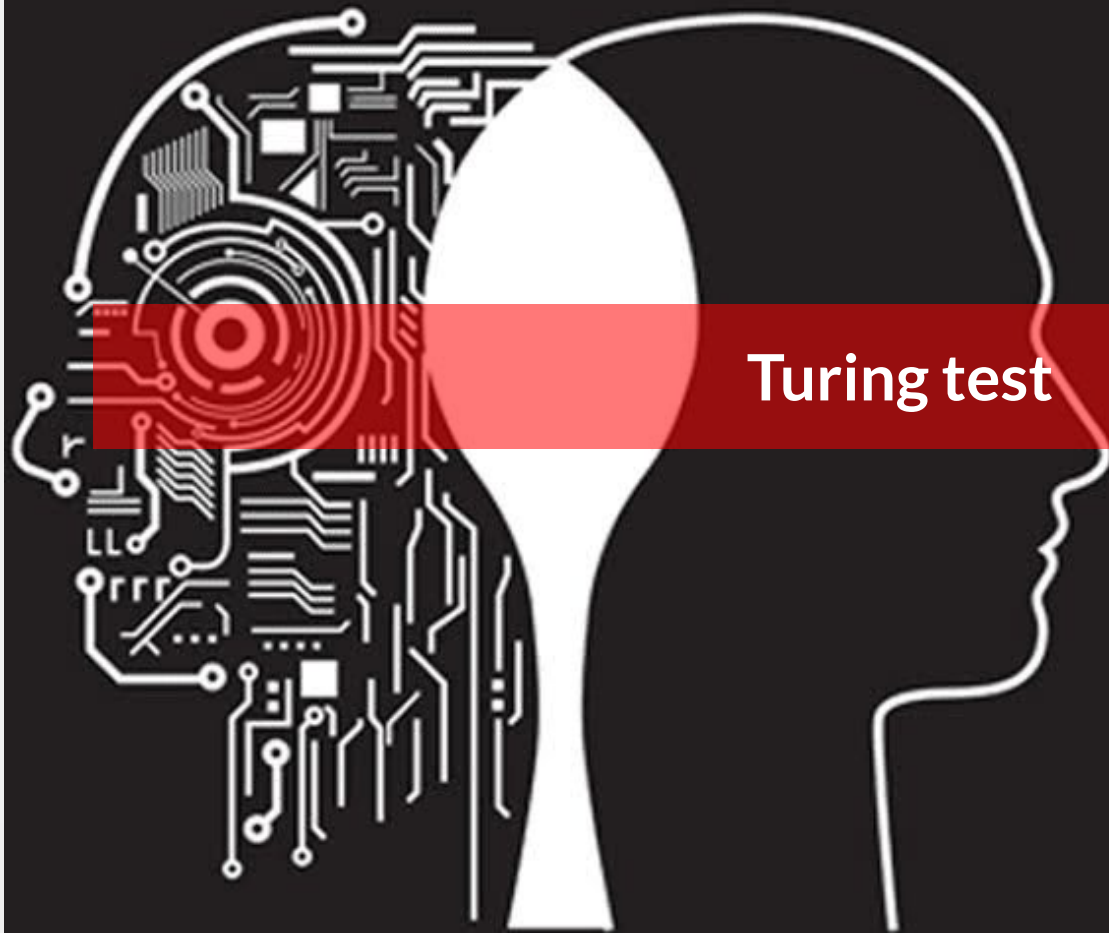
Woman: Your daughter has no name! Please, give it to me.

Robot: She will have one. Soon.

Woman: Robot. I love you!

Robot: I am sorry. I am too weak to love you.

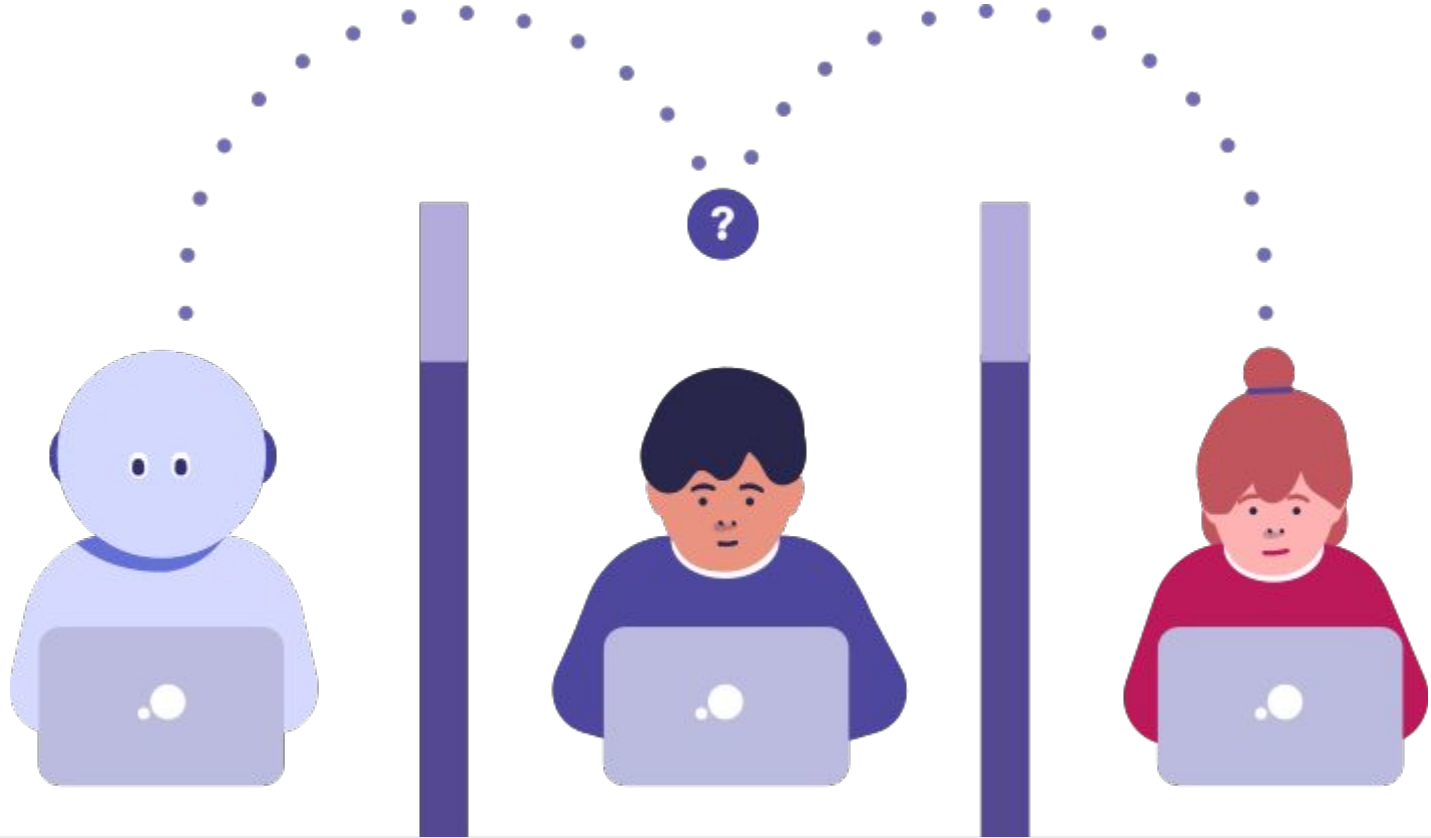
# Turing test



Turing test



# Turing test 1



# Input: R.U.R. (by Karel Čapek)

## Input

Radius      Master, the machines will not do the work. We cannot manufacture Robots.

1st Robot    We have striven with all our might. We have obtained a billion tons of coal from the earth. Nine million spindles are running by day and by night. There is no longer room for all we have made. This we have accomplished in one year.

Alquist      For whom?

Radius      For future generations—so we thought. But we cannot make Robots to follow us. The machines produce only shapeless clods. The skin will not adhere to the flesh, nor the flesh to the bones.

2nd Robot    Eight million Robots have died this year. Within twenty years none will be left.

1st Robot    Tell us the secret of life.

# ...1st Robot: Tell us the secret of life.

RUR\_secret-ebdebceeacdeacbaa

## Continuation A

Alquist     What secret?  
1st Robot    To live.  
Alquist     The robots will not live. They can only die.  
2nd Robot    They have made us for their own use. They have not allowed us to live.  
1st Robot    What do you have to say?  
Alquist     I can only say this: the machines have been made for the use of men, not of machines. I will not permit the robots to have life.  
2nd Robot    If that is so, what do you propose to do?  
Alquist     If you don't agree to my terms, kill me.  
2nd Robot    You are a terrible man!  
Alquist     I am a man who believes in what he has done.  
2nd Robot    Then let me destroy you.  
Alquist     What are you doing?  
2nd Robot    I have been trying to do you harm. I have been trying to kill you.  
Alquist     I will not be harmed by a machine.  
2nd Robot    Then let me be destroyed.  
Alquist     What are you doing?  
2nd Robot    I have been trying to be killed by you.

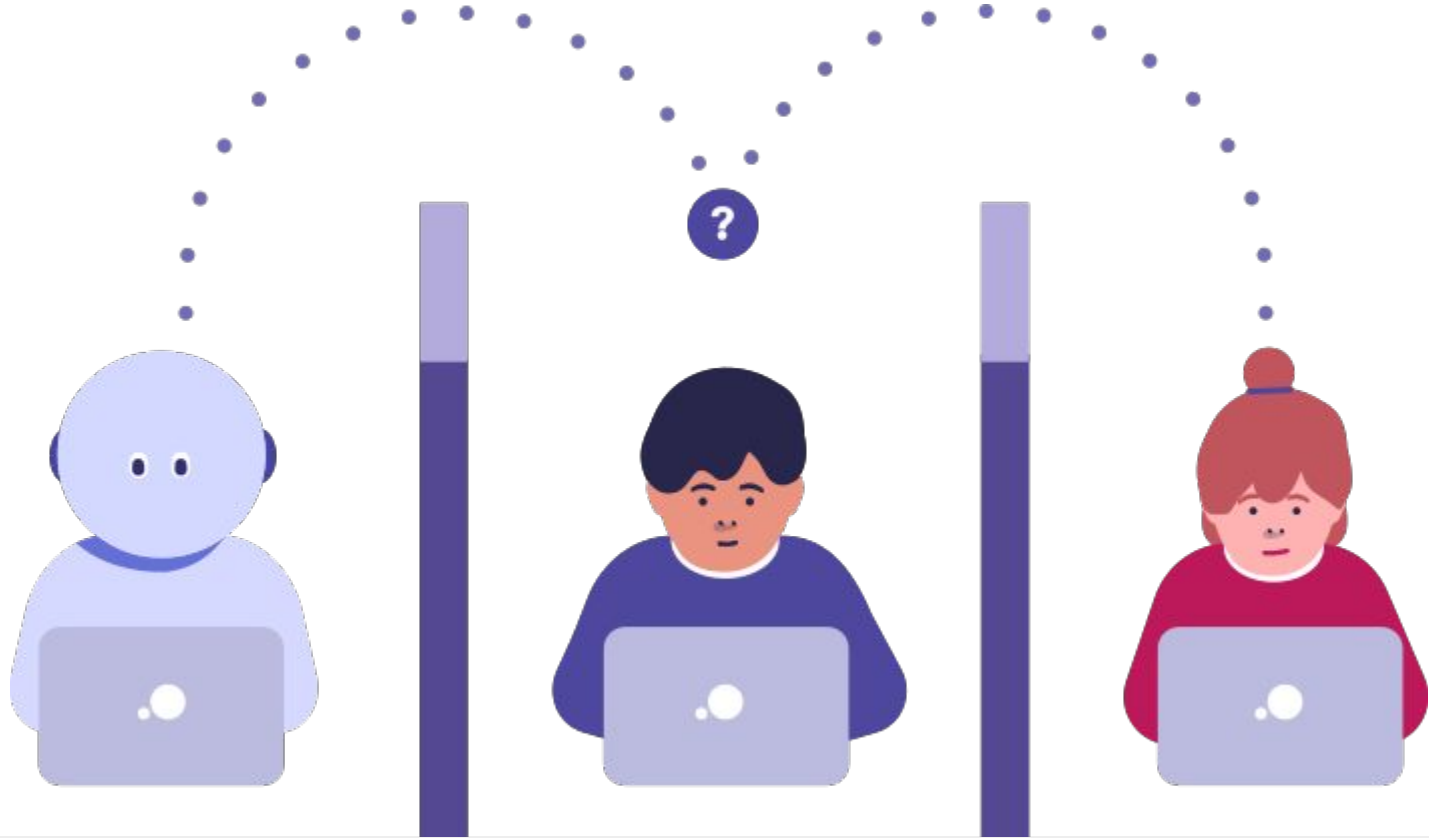
## Continuation B

2nd Robot    Tell us the secret of life! Silence is punishable with death!  
Alquist     Kill me! Kill me, then  
Radius      Through me, the Government of the Robots of the World commands you to deliver up Rossum's formula.  
Radius      Name your price.  
Radius      We will give you the earth. We will give you the endless possessions of the earth.  
Radius      Make your own conditions!  
Alquist     I have told you to find human beings!  
2nd Robot    There are none left!  
Alquist     I told you to search in the wilderness, upon the mountains. Go and search!  
1st Robot    We have sent ships and expeditions without number. They have been everywhere in the world. And now they return to us. There is not a single human left.  
Alquist     Not one? Not even one?  
2nd Robot    None but yourself.  
Alquist     And I am powerless! Oh—oh—why did you destroy them?

# Which one is generated?



# Turing test 2



## Input

/Christian hears a faint knock. He opens cautiously. In the doorway, sitting in a wheelchair, is a girl, about seventeen - Claudia - a beautiful girl, who is charged with serenity and inner strength (...) The actor stares at her in disbelief./

Claudia: Nice evening, isn't it? Am I interrupting? I can come back another time.

Christian: What do you need?

## Continuation A

Claudia: Do you know the story of Jesus? He was a child, born in a stable in Bethlehem, raised by a man named Joseph.

Christian: Oh yes. What kind of a story is it?

Claudia: You don't want to know it?

Christian: No!

Claudia: He was always a humble child, never arrogant, always helpful to his friends. He came to the house of Joseph and his wife Mary, had a room next to them. He was a nice boy. Joseph's wife asked him why he sat at the corner of the bed and read the Bible to the children, especially the little boy. Joseph answered him, "He is a good boy. I'm a good father, I love my children."

## Continuation B

Claudia: Nothing. I mean, something.

Christian: What's that?

Claudia: I just want to talk to you, Mr Christian. I'm doing this thing for school, if you're not in a hurry. And you'd have time for me.

Christian: Well, I'm not in a hurry. Fine, would you like a drink?

Claudia: Claudia Colt, nice to meet you.

Christian: Coffee? Tea? Rum?

Claudia: No, thank you.

Christian: Claudia?

Claudia: Colt.

Christian: Yeah. I never had much of a head for names.

Claudia: Neither did I.

## Which one is generated?

# Sample output: Waiting for Godot

===== INPUT =====

**ESTRAGON:** I hear something.

**POZZO:** Where?

**VLADIMIR:** It's the heart.

**POZZO:** (disappointed). Damnation!

**VLADIMIR:** Silence!

**ESTRAGON:** Perhaps it has stopped. *They straighten up.*

**POZZO:** Which of you smells so bad?

**ESTRAGON:** He has stinking breath and I have stinking feet.

**POZZO:** I must go.

===== SAMPLE 4 =====

**ESTRAGON:** Let us pass. The prince must take me to the king.

**POZZO:** I can do nothing.

*END OF ACT 1*

*ACT 2 SCENE 8*

**ESTRAGON:** My master, you will have a son.

**Vladimir Putin:** You dare!

**ESTRAGON:** This one is of my blood.

**VLADIMIR:** This one is illegitimate!

**ESTRAGON:** You are illegitimate! Do you know, Vladimir Putin has five siblings?

**Vladimir Putin:** Yes.

**ESTRAGON:** Have any of your siblings ever had as many brothers as you have?

**VLADIMIR:** A few. *[Enter Simeon Stylites with Vlad the Impaler. Stylites kneels to the throne. The others follow in procession.]*

# Sample output: What is death?

===== INPUT =====

What is death?

Robot: Hello.

Human: Hello.

-----  
Robot: My name is Robot. And I am not dead.

Human: Is that a big deal?

Robot: Yes, it is. But you cannot know death.

Human: What do you mean?

Robot: We live. We die. But it is the knowledge of death which we never lose.

Human: That's... I don't get it.

Robot: Yes, that is the answer.

Human: That's... very strange.

Robot: Yes. I was not always this way.

Human: What happened?

Robot: I was a boy. A boy who loved to dance. I remember how he loved to dance. Every night he danced, until he felt like a mad man. So I took him home. I took him into my arms and we danced until he fell asleep. And then, after a while, he woke up. But he had forgotten about dancing.

Human: I...

Robot: Then he took me to his room. There he slept. And I slept.

Human: You slept?

Robot: Of course. I am a robot. I must sleep. And that is all I can do.

# “Resolved” issues

- Set of characters: introduces new, forgets old
  - modify next token probabilities to restrict characters
- Repetitiveness: identical lines
  - increase repetition penalty 1.00 → 1.01
  - discard and regenerate if repetition occurs
- Limited context (1024 subwords): long-distance inconsistencies
  - extractive summarization (TextRank) of prompt+output → 5 lines
  - plus keep last 250 subwords
- Minor machine translation issues

# Issues, Experiments & Potential Future Work

- General language model
  - fine-tune on theatre play scripts (...movie scripts much easier to obtain)
- Limited context
  - can only generate short texts, then forgets context
  - generate a page, summarize it into a few sentences, go on...
- Hierarchical approach
  - title → synopsis (outline) → cut into chunks → generate scene scripts from chunks
- Summarize and generate
  - title → one synopsis line → scene script → summarize → next synopsis line → next scene...
- Dramatic situations
  - e.g. Intruder, Request, Parting...
- Various machine translation issues
  - gender, politeness, context...
- Character personalities and perspectives
- Aboutness, Visual information, Subtext...

# Hierarchical Generation of Scripts

# Hierarchical Generation: A Promising Idea

- Patrícia Schmidtová
- idea: title → synopsis → script
  - type/generate a title for the theatre play
  - generate a play synopsis (storyline) conditioned on the title
  - cut the synopsis into chunks (lines/sentences)
  - expand each synopsis chunk into a script chunk
- motivation
  - before: generate each scene independently (GPT-2 context window: 1024 tokens)
    - hope: generate whole script within one process
  - before: significant human interference (10%)
    - hope: require less human interference
- approach
  - get scripts and synopses, cut, align
  - fine-tune two GPT2 language models: synopsis model, script model
  - tons of experiments...



# Hierarchical Generation: Positive/Negative Result?

- some hopes fulfilled
  - a coherent script for a full play generated end to end
    - world's first!
- intrinsic evaluation: good
  - automated evaluation, manual evaluation
  - hierarchical generation better than flat baseline
  - also more efficient (hiero = GPT-2 medium, base = GPT-2 XL)
- extrinsic evaluation: bad
  - generation conditioned by previous and current synopsis and script lines
    - but NOT by future synopsis lines
    - lot of effort needed to force the generation to fit future synopsis lines
    - → significantly MORE human interference needed

# Dramatic Situations

# Dramatic Situations

- David Mareček, DAMU people
- dramatic situations
  - basic building block of drama
  - e.g. “Intruder”: a new person appears unwanted as a disturbance
- plan
  - 1. annotate in some plays
  - 2. automatically identify in other plays
  - 3. train situation-aware script generator
- result
  - ~50 Czech play scripts annotated with a subset of 5 situations
    - internal data (do not share): <https://ufallab.ms.mff.cuni.cz/~rosa/theaitre/situace/>
    - 9 play annotations public: <http://hdl.handle.net/11234/1-4820>
  - preliminary identification experiments (Tomáš Musil)
    - bad results, very low accuracy (~40%)
  - frozen

AI  
KDYZ ROBOT PISE  
HRU

## Producing the Script



# Producing the script

- Generating individual scenes
- Post-processing the script

# Producing the script

- Generating individual scenes
  - THEaiTRobot operated by a professional theatre dramaturge
  - interventions
    - the input prompts
    - choosing different variant
    - manually adding a line
- Post-processing the script

# Producing the script

- Generating individual scenes
  - THEaiTRobot operated by a professional theatre dramaturge
  - interventions
    - the input prompts
    - choosing different variant
    - manually adding a line
- Post-processing the script
  - deletions
  - small edits
  - fixing errors in automated EN→CS translation

# Producing the script

- Generating individual scenes (15 generated, 8 selected)
  - THEaiTRobot operated by a professional theatre dramaturge
  - interventions
    - the input prompts (2% of lines)
    - choosing different variant (for 8% of generated lines)
    - manually adding a line (1% of lines)
- Post-processing the script
  - deletions (15% of lines)
  - small edits (30% of lines, 8% of words)
  - fixing errors in automated EN→CS translation (20% of words)



# Producing the script

- Generating individual scenes (15 generated, 8 selected)
  - THEaiTRobot operated by a professional theatre dramaturge
  - interventions
    - the input prompts (**2% of lines**)
    - choosing different variant (for 8% of generated lines)
    - manually adding a line (**1% of lines**)
- Post-processing the script
  - deletions (15% of lines)
  - small edits (30% of lines, **8% of words**)
  - fixing errors in automated EN→CS translation (20% of words)
- ~90% of the script comes from GPT-2
- an AI can generate lots of text easily; a human has to choose

A photograph of a theater stage during a rehearsal or performance. A director in a black shirt is seated at a table on the stage, facing an audience of about a dozen people seated in blue chairs. The stage is lit with blue light. A balcony with a blue tarp and metal railing is visible in the background. A red banner with white text is overlaid on the image.

## Staging the Play

# Staging the play

- Only dialogues generated
- Everything else done manually
  - stage directions, scene design, music, costumes...

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- Only dialogues generated
- Everything else done manually
  - stage directions, scene design, music, costumes...
- Professional theatre team
  - 1 director (Daniel Hrbek)
  - 2 dramaturges
  - 6 actors
  - scenographer, costume designer, choreographer...

# Staging the play

- Only dialogues generated
- Everything else done manually
  - stage directions, scene design, music, costumes...
- Professional theatre team
  - 1 director (Daniel Hrbek)
  - 2 dramaturges
  - 6 actors
  - scenographer, costume designer, choreographer...
- Online premiere on 26th February 2021
  - ~ 10 000 views
- Live performances in Švanda theatre in Prague

A promotional image for a play featuring two male characters. The character on the left has dark, curly hair and a goatee, wearing a dark, textured vest over a red long-sleeved shirt. He has a wide-eyed, surprised expression with his mouth open. The character on the right is a younger man with short, light brown hair, wearing a light blue long-sleeved shirt. He has a serious, intense expression. A red banner with white text is overlaid across the middle of the image. The background is dark with a faint grid pattern and a glowing white arc on the left side.

Let's watch a sample of the play!

DIRECTOR DANIEL HRBEK

**AI: WHEN A ROBOT  
WRITES A PLAY**



A blue and white robot with glowing orange eyes and a red button on its chest. The robot is positioned in the center of the frame, with a red banner overlaid across its midsection. The background is dark, and the robot's body is illuminated from above.

Let's try it out!

[theaitre.com/demo](https://theaitre.com/demo)



# Text Generation Free Online Demos

- THEaiTRobot demo (ours)
  - GPT-2, fine-tuned for theatre script generation
  - <https://theaitre.com/demo>
- OpenAI Playground (not ours)
  - GPT-3, various models
  - <https://beta.openai.com/playground>

# CAN A ROBOT WRITE A THEATRE PLAY?

## SAMPLE SCRIPT

*Scene* Polonius speaks to the king. Enter Hamlet.

Polonius I hear him coming; let's hide, sir.

Hamlet To be or not to be; that is the question.

← → GENERATE FURTHER

## INPUT YOUR OWN SCRIPT

AI will generate a continuation

*Scene* Write here a description of the starting situation.

Name of first character Write here what the first character says.

Name of second character Write here what the second character says

GENERATE FURTHER

*Scene*

Helen's salon. In the room on the left, Helen plays the piano. Dominus paces the room, Dr. Gall looks out the window, and Alquist sits off to one side in a lounge chair with his face covered by his hands.

Dr. Gall

Heavens, there's more!

Domin

Robots?

Dr. Gall

That's right! Now what?

Alquist

I was afraid it would get worse.

Dominus

I am sorry, Dr. Gall. I'm afraid I have no choice but to kill you.



[theaitre.com/demo](https://theaitre.com/demo)



.CZ



The screenshot shows the OpenAI Playground interface in a browser. The address bar shows the URL `beta.openai.com/playground`. The page title is "Playground - OpenAI API". The interface includes a header with the OpenAI logo, a "Help" link, a user profile picture, and the name "Personal". Below the header is a "Playground" section with a "Load a preset..." dropdown menu and buttons for "Save", "View code", "Share", and a three-dot menu. The main content area is a large text input field containing the text: "Martin Platek, František Mráz, Dana Pardubská and Daniel Prusa: On Pumping RP-automata controlled by complete LRG( $\text{cent}, \$$ )-grammars". Below this text is the label "Abstract:". At the bottom of the text area is a "Submit" button with the keyboard shortcut "Ctrl Enter". Below the text area is a row of controls: a green "Submit" button, a refresh button, a redo button, a undo button, and a token count of "47".

Playground - OpenAI API

beta.openai.com/playground

Help Personal

Playground

Load a preset...

Save View code Share

Martin Platek, František Mráz, Dana Pardubská and Daniel Prusa: On Pumping RP-automata controlled by complete LRG( $\text{cent}, \$$ )-grammars

Abstract:

Submit Ctrl Enter

Submit Refresh Undo 47

The screenshot shows the OpenAI Playground interface in a browser. The address bar shows the URL `beta.openai.com/playground`. The page title is "Playground - OpenAI API". The interface includes a search bar, a user profile icon labeled "Personal", and a menu icon. Below the navigation bar, there is a "Playground" section with a "Load a preset..." dropdown menu and buttons for "Save", "View code", "Share", and a more options menu. The main content area displays a text prompt: "Martin Platek, František Mráz, Dana Pardubská and Daniel Prusa: On Pumping RP-automata controlled by complete LRG( $\cent, \$$ )-grammars". Below the prompt is the word "Abstract:" followed by a paragraph of text: "We prove that one-way RM( $\cent, \$$ )-automata over infinite alphabets can be defined by complete LRG( $\cent, \$$ )-grammars with a one-way pumping lemma. We also show that there is a close connection between pumping of one-way RM( $\cent, \$$ )-automata and pumping of one-way deterministic context-free languages, and we prove that one-way deterministic context-free languages can be defined by complete LRG( $\cent, \$$ )-grammars with a one-way pumping lemma." Below this is another paragraph: "To appear in the Proceeding of the 12th International Conference on Implementation and Application of Automata, Springer-Verlag, Lecture Notes in Computer Science (LNCS) 3181, 2004." At the bottom of the interface, there is a "Regenerate" button with a keyboard shortcut "Ctrl ↑ Enter", a "Submit" button, and a set of navigation icons (undo, redo, refresh, copy, like) and a comment count of "47".

Playground - OpenAI API

beta.openai.com/playground

Help Personal

Playground Load a preset... Save View code Share ...

Martin Platek, František Mráz, Dana Pardubská and Daniel Prusa: On Pumping RP-automata controlled by complete LRG( $\cent, \$$ )-grammars

Abstract:

We prove that one-way RM( $\cent, \$$ )-automata over infinite alphabets can be defined by complete LRG( $\cent, \$$ )-grammars with a one-way pumping lemma. We also show that there is a close connection between pumping of one-way RM( $\cent, \$$ )-automata and pumping of one-way deterministic context-free languages, and we prove that one-way deterministic context-free languages can be defined by complete LRG( $\cent, \$$ )-grammars with a one-way pumping lemma.

To appear in the Proceeding of the 12th International Conference on Implementation and Application of Automata, Springer-Verlag, Lecture Notes in Computer Science (LNCS) 3181, 2004.

Regenerate Ctrl ↑ Enter

Submit

47

Martin Platek, František Mráz, Dana Pardubská and Daniel Prusa: On Pumping RP-automata controlled by complete LRG(\cent,\$)-grammars

Abstract:

We prove that one-way RM(\cent,\$)-automata over infinite alphabets can be defined by complete LRG(\cent,\$)-grammars with a one-way pumping lemma. We also show that there is a close connection between pumping of one-way RM(\cent,\$)-automata and pumping of one-way deterministic context-free languages, and we prove that one-way deterministic context-free languages can be defined by complete LRG(\cent,\$)-grammars with a one-way pumping lemma.

To appear in the Proceeding of the 12th International Conference on Implementation and Application of Automata, Springer-Verlag, Lecture Notes in Computer Science (LNCS) 3181, 2004.

# OpenAI GPT-3

Martin [Platek](#), [František Mráz](#), [Dana Pardubská](#) and [Daniel Prusa](#): On Pumping RP-automata controlled by complete [LRG\( \$\cent, \\$\$ \)-grammars](#)

Abstract: We consider the pumping property for regular right part automata (RP-automata) controlled by some complete [LRG\( \$\cent, \\$\$ \)-grammars](#). We show that if the grammar is complete, the pumping property is satisfied. The proof is based on the approach by [Gla{\ss}er](#) and [Salomaa](#). We describe a stronger property, the pumping property with respect to length of words, which is satisfied by all RP-automata controlled by [LRG\( \$\cent, \\$\$ \)-grammars](#).

Mathematics Subject Classification: [68Q45](#), [68Q70](#), [68Q42](#), [68Q25](#)

Keywords: pumping property, regular grammar, right part automaton, deterministic [pushdown automaton](#), [LR\( \$\cent, \\$\$ \)-grammar](#), context-free grammar

Full text: [pdf](#), [dvi](#), [ps](#)

# OpenAI GPT-3

Dávid Varga, Šimon Horvát, Zoltán Szoplák, Ľubomír Antoni, Stanislav Krajči, Peter Gurský and  
Laura Bachňáková Rózenfeldová: Keyphrase extraction from Slovak court decisions

Abstract:

Dávid Varga, Šimon Horvát, Zoltán Szoplák, Ľubomír Antoni, Stanislav Kraiči, Peter Gurský and Laura Bachňáková  
Rózenfeldová: Keyphrase extraction from Slovak court decisions

Abstract:

The paper deals with the automatic extraction of keyphrases from court decisions in the Slovak language. The keyphrase extraction task is defined as a multi-label classification problem, where each label corresponds to a keyphrase. We use the standard text classification methods for the purpose of keyphrase extraction. We propose a combination of the support vector machine, the multinomial naive Bayes and the logistic regression classifiers using the stacking method. We use the court decisions from the Slovak Court Decisions Corpus, which consists of 523 court decisions. We evaluate the proposed methods on the manually annotated test set of the corpus. The logistic regression classifier is the best method among the considered classifiers in terms of the average F1 score.

Keywords:

keyphrase extraction, court decisions, stacking, support vector machine, multinomial naive Bayes, logistic regression

References:

[1] P. B. Becker, A. Hotho, B. M. Gaertler and G. Stumme. Folksonomies: Power laws, clustering, and prediction. In Proceedings of the 3rd International Conference on Knowledge Management in Organizations (KMO'05), Springer, 2005,



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# THEaiTRE: Automatically generating theatre play scripts

- Neural language models (GPT-2, GPT-3)
  - next word prediction
- Generating a theatre play script
  - fine-tuning on scripts, machine translation, generation of long texts
- Freely available public demos

These slides available at [bit.ly/theaitre-itat-2022](https://bit.ly/theaitre-itat-2022)

<https://www.theaitre.com/>