GDC × NetEase Games Passion of gamers | March 21-25,2022 San Francisco,CA

NetEase Games AI Lab

# An Easy-to-Use Cutscenes Preview Tool

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#GDC22
#NetEase Games

# NetEase Games AI Lab

- Established in 2017
- Apply AI technology to Games
- Research Interests: CV, NLP, RL, CG and Speech Processing

# Outline

- Background & Problems
- Cutscenes Preview Tool
- Why & How
- Closing

PART 1

# Background & Problems

# Cutscene

## A sequence in a video game

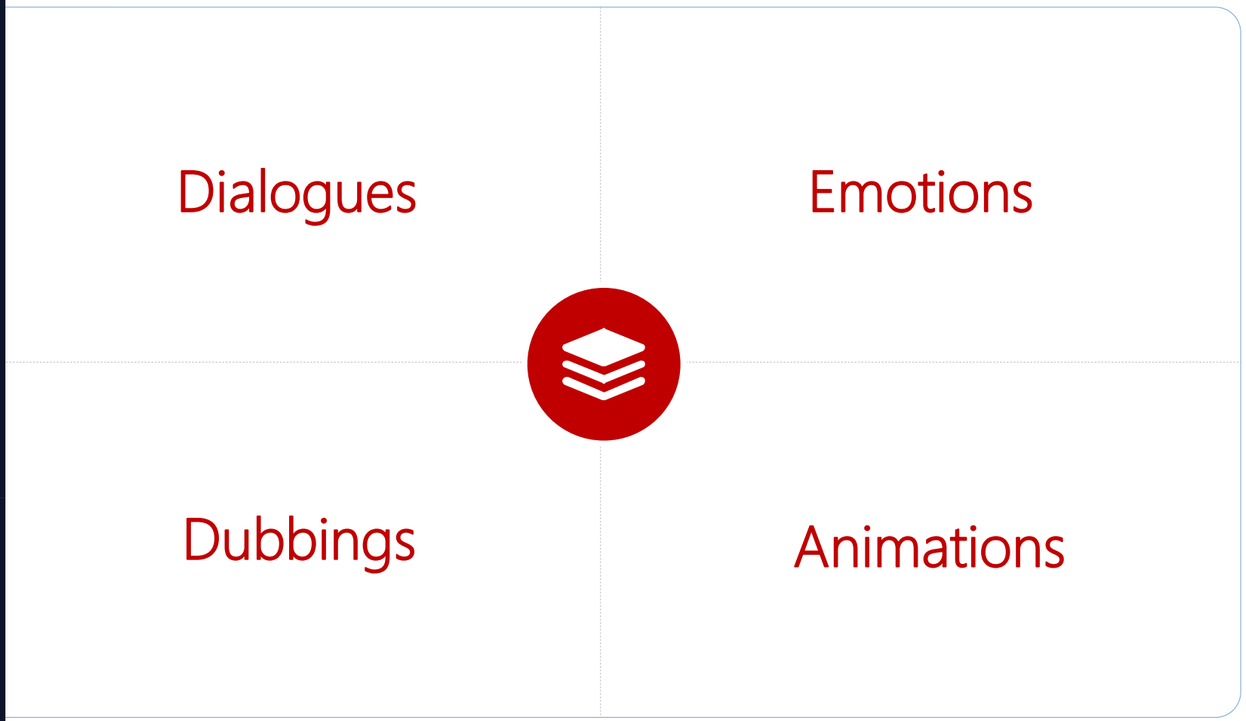
Non-interactive, interrupts gameplay, and aims to …

- Propel narrative
- Set the mood
- Reward players
- Create emotional connections

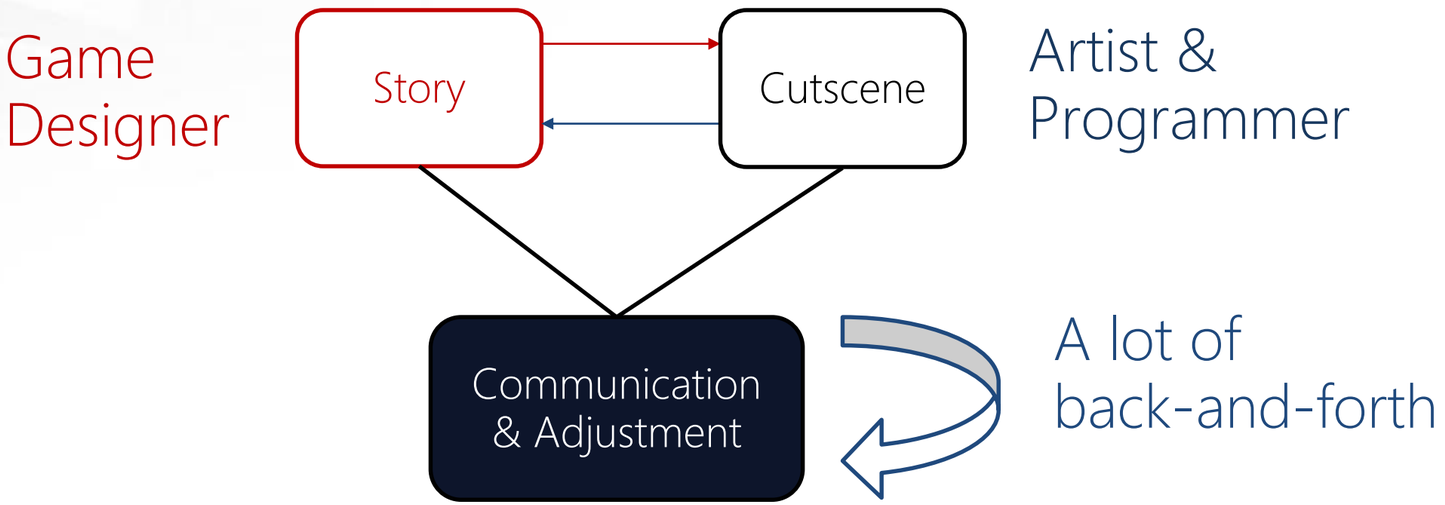
# Cutscene

A sequence in a video game

including …



# Cutscene Production



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# How to Improve Efficiency

## Better design communication

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# Cutscene Prototype

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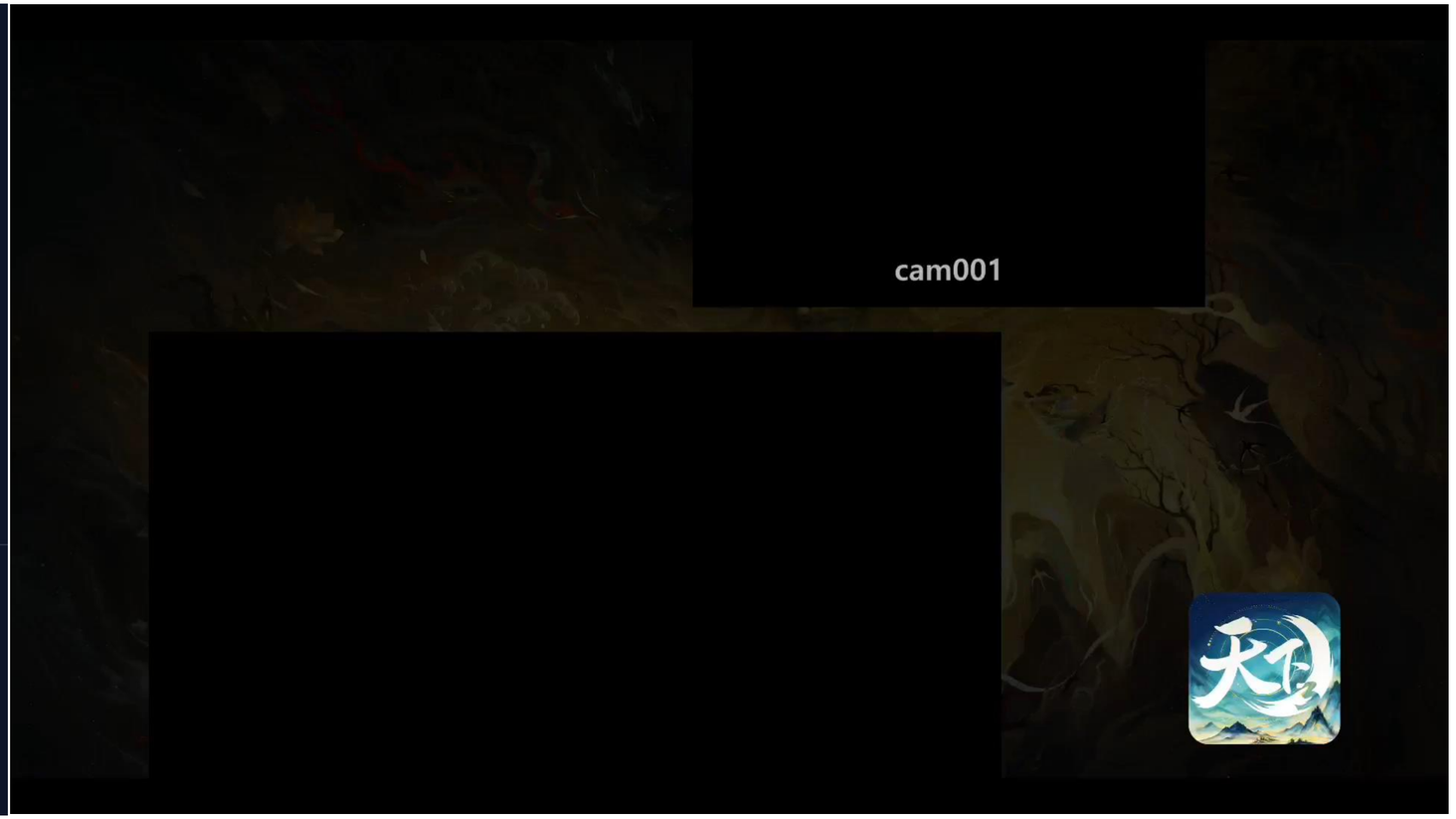
A bridge between stories and cutscenes.

For example: manuscripts, storyboard.

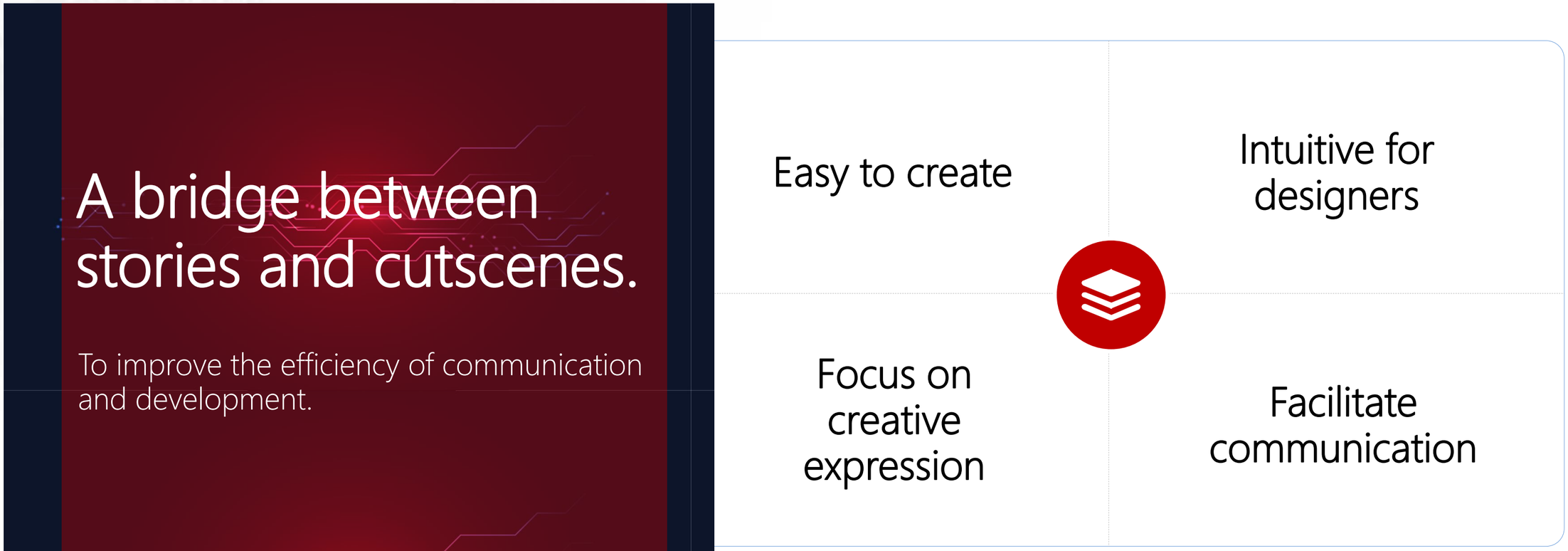



Materials from the NetEase Game *The World 3* And *Fantasy Westward Journey*

# Cutscene Prototype

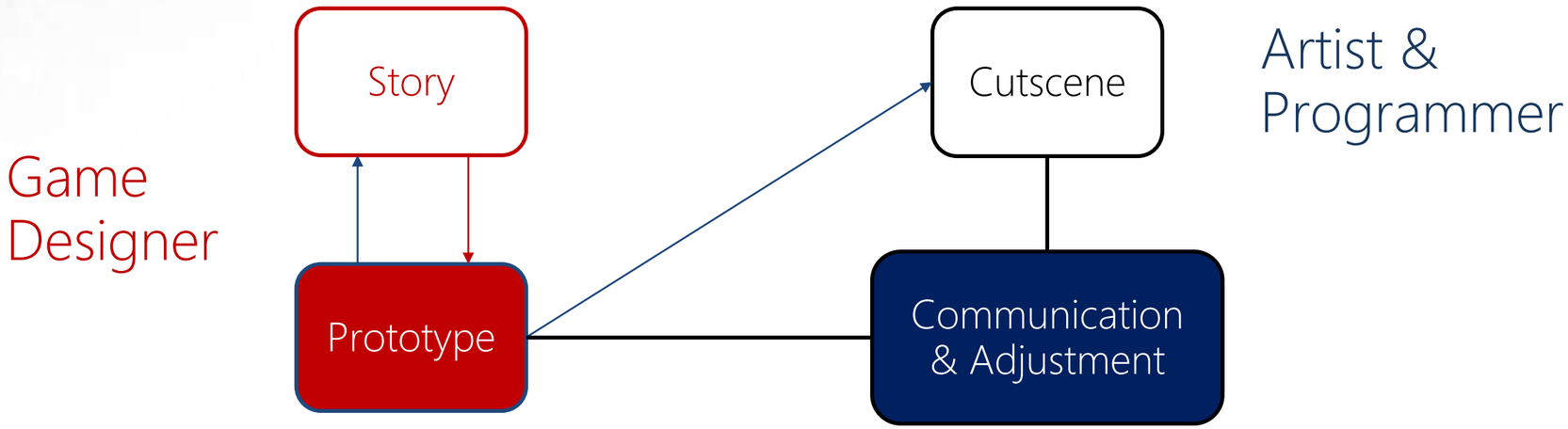
## A bridge between stories and cutscenes.

To improve the efficiency of communication and development.



# Cutscene Prototype

- Easy to adjust by yourself
- Directly express the meaning of designer
- Improve the efficiency of communication and development



PART 2

# Main Message

# An Easy-to-Use Cutscenes Preview Tool

Enabling designers to efficiently produce cutscene prototypes during early production

Story to script technology

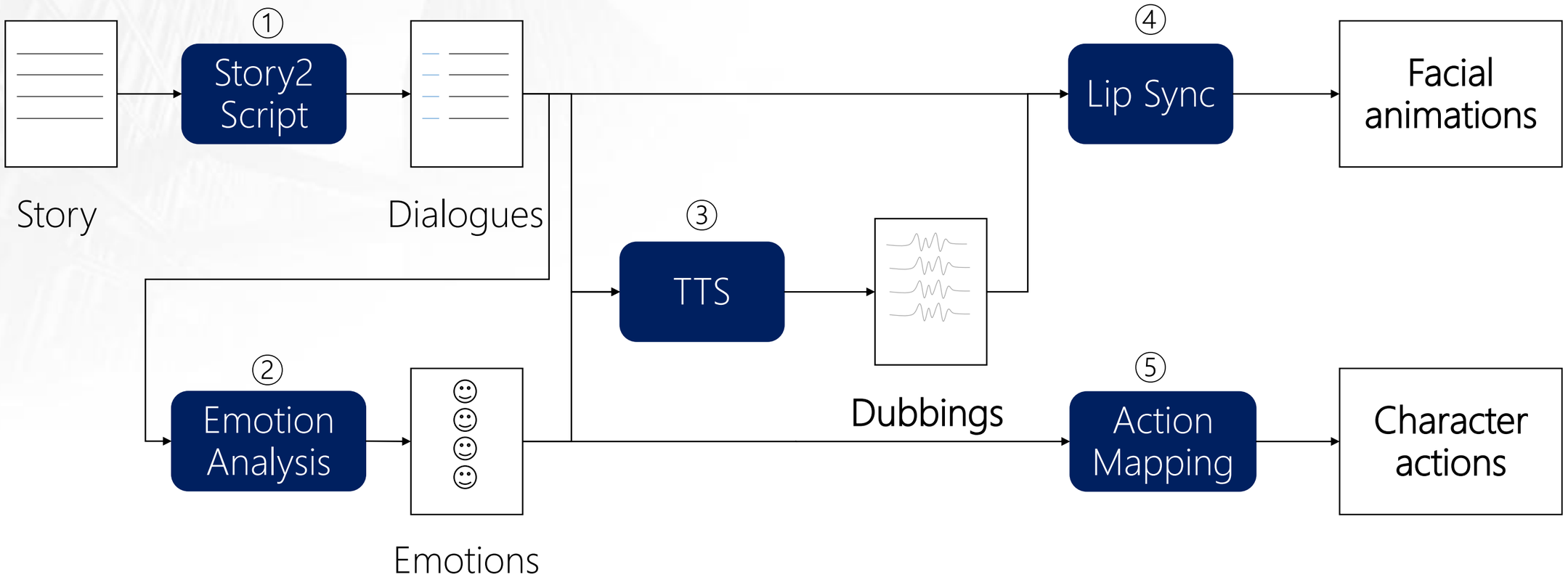
Script emotion analysis

Emotional speech synthesis

Speech animation generation

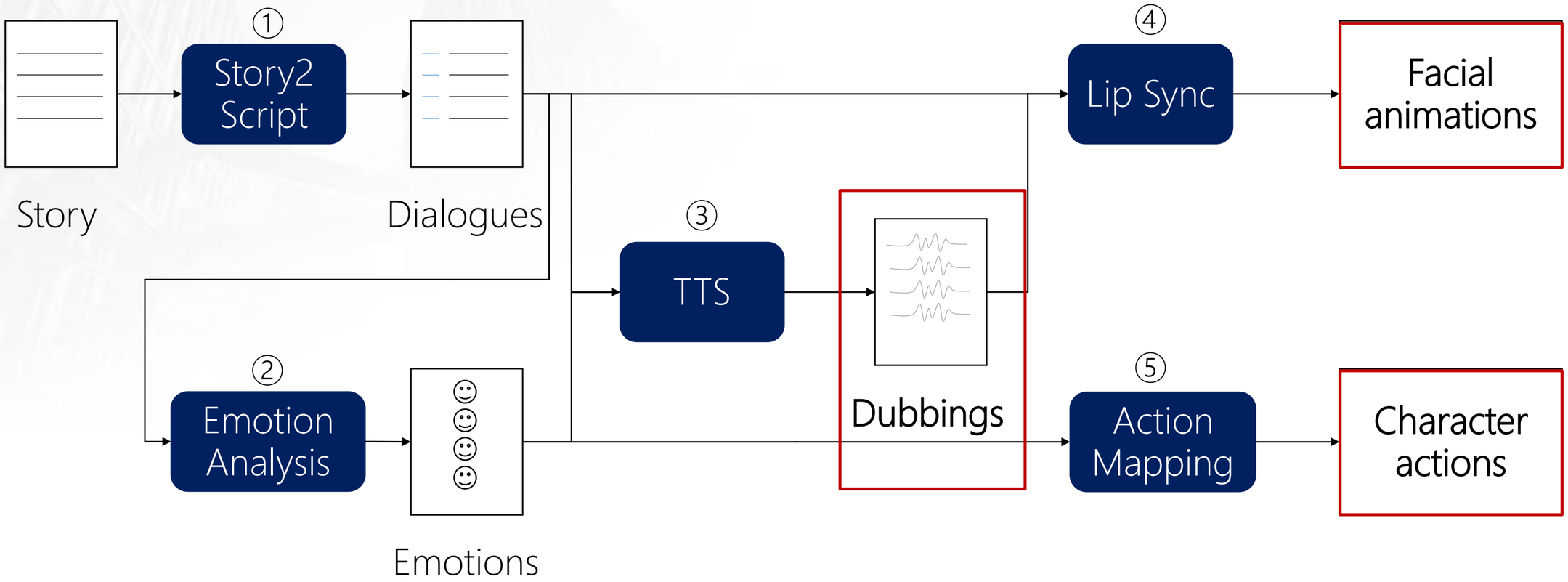
Emotional action mapping

# Architecture



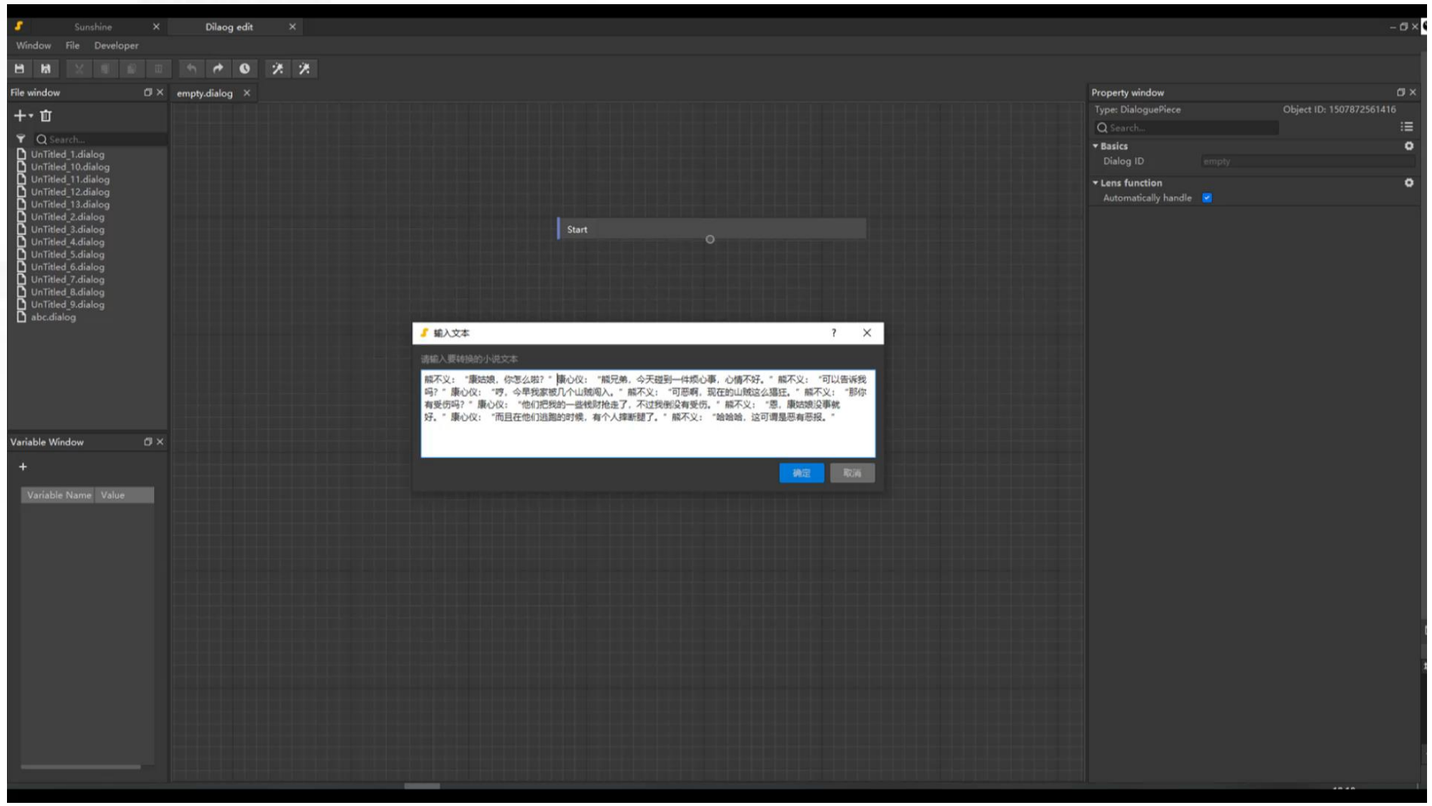

- Pipeline with 5 plug-ins
- Plug-and-play

# Architecture




- Pipeline with 5 plug-ins
- **Outputs** are used to render the cutscene prototypes

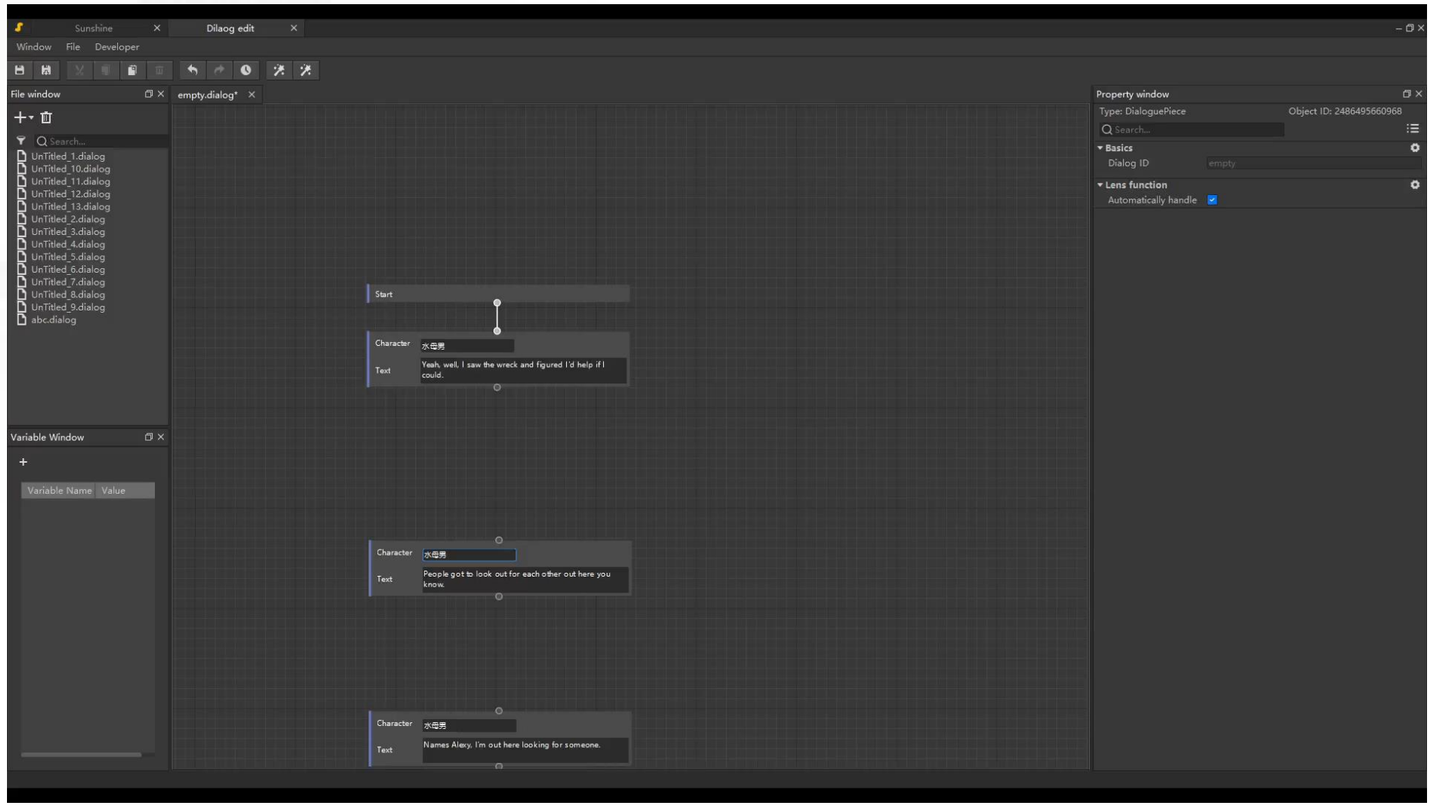
# An Easy-to-Use Cutscenes Preview Tool




Fully automatic tool, TWO-CLICKs within Montage Editor

Materials from the NetEase Game *Fantasy Westward Journey 3D*

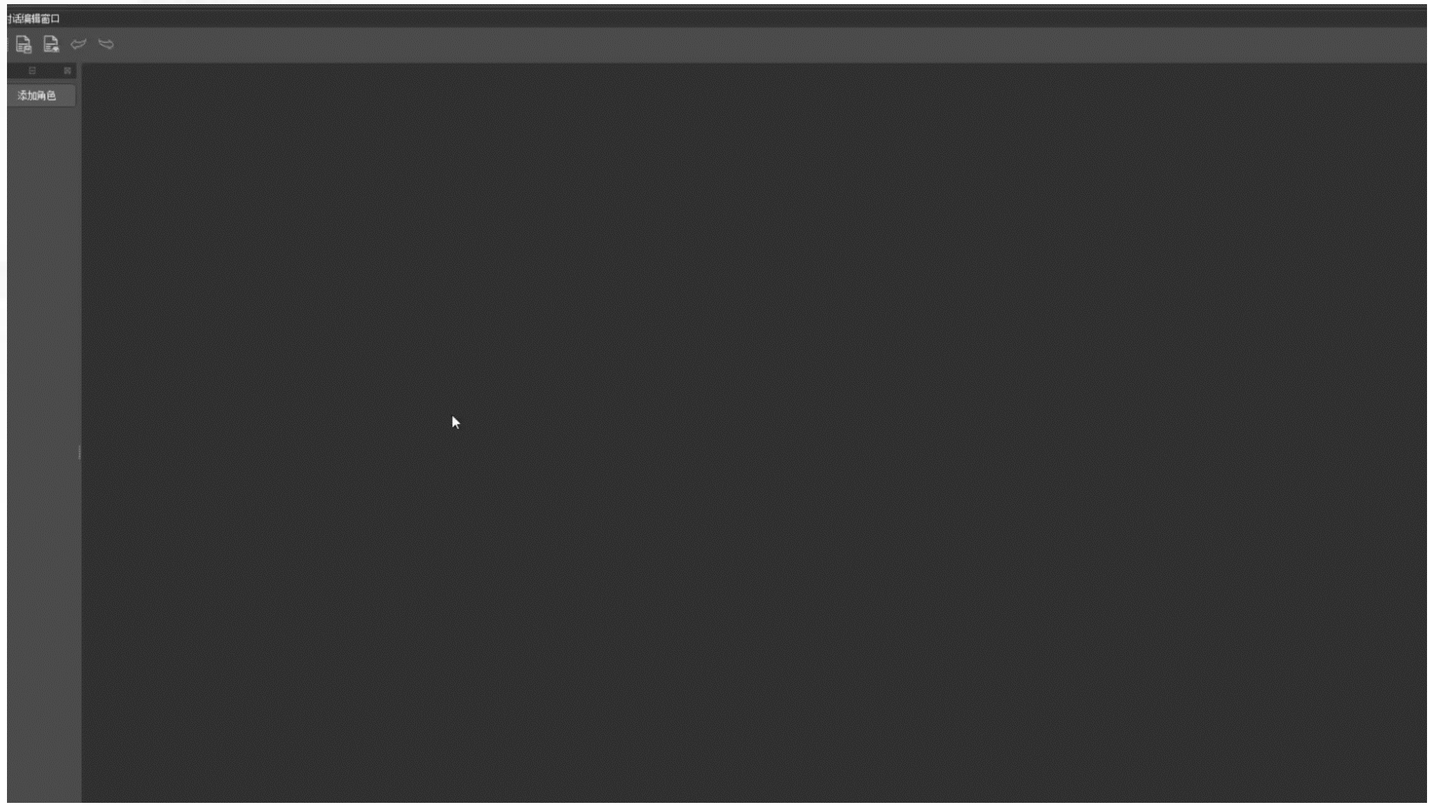
# An Easy-to-Use Cutscenes Preview Tool




Using existing voice assets

Materials from the NetEase Games *Knives Out* And *LifeAfter*

# An Easy-to-Use Cutscenes Preview Tool



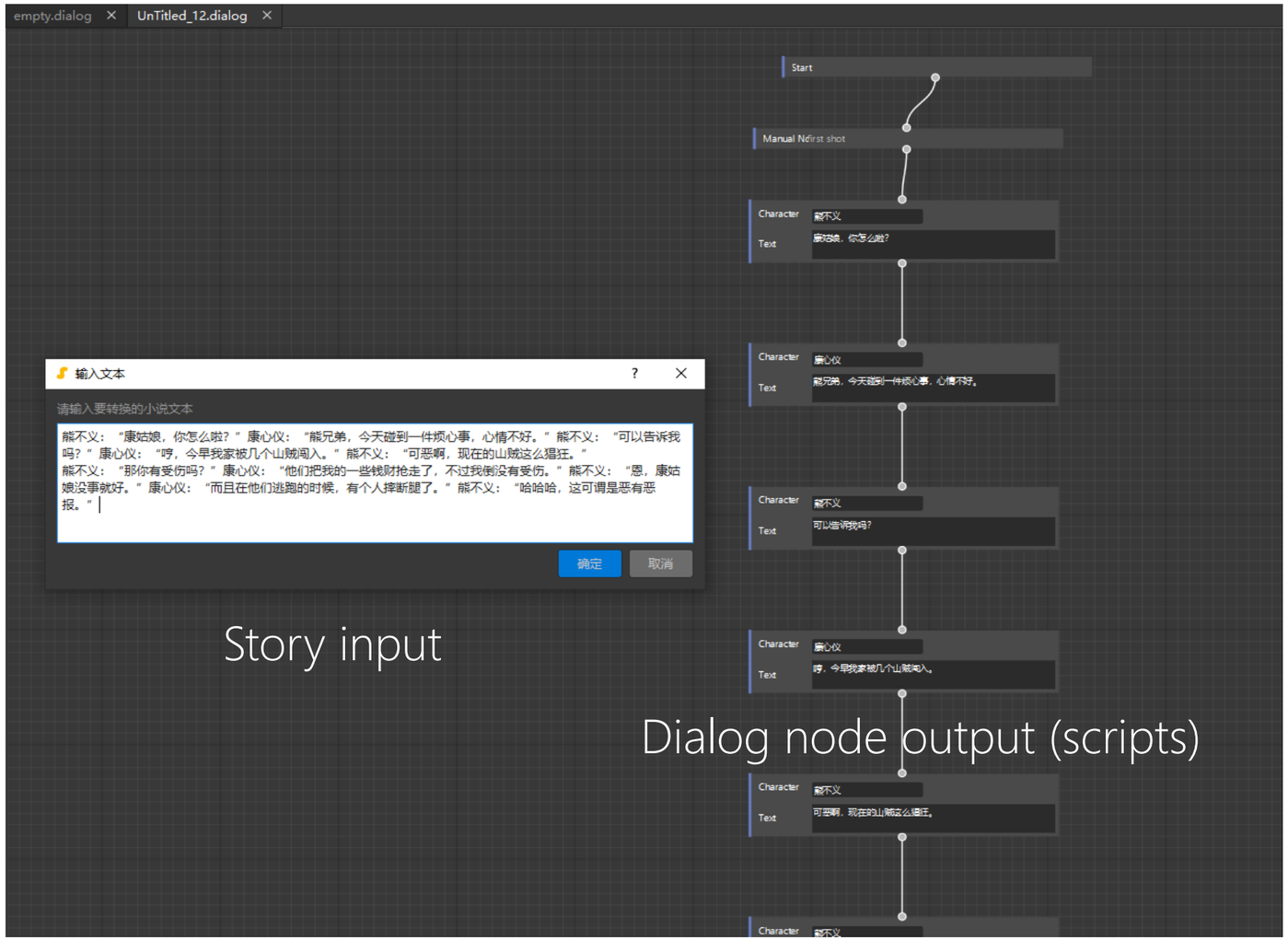

Applying to Messiah Editor

Materials from the NetEase Game *The World 3*

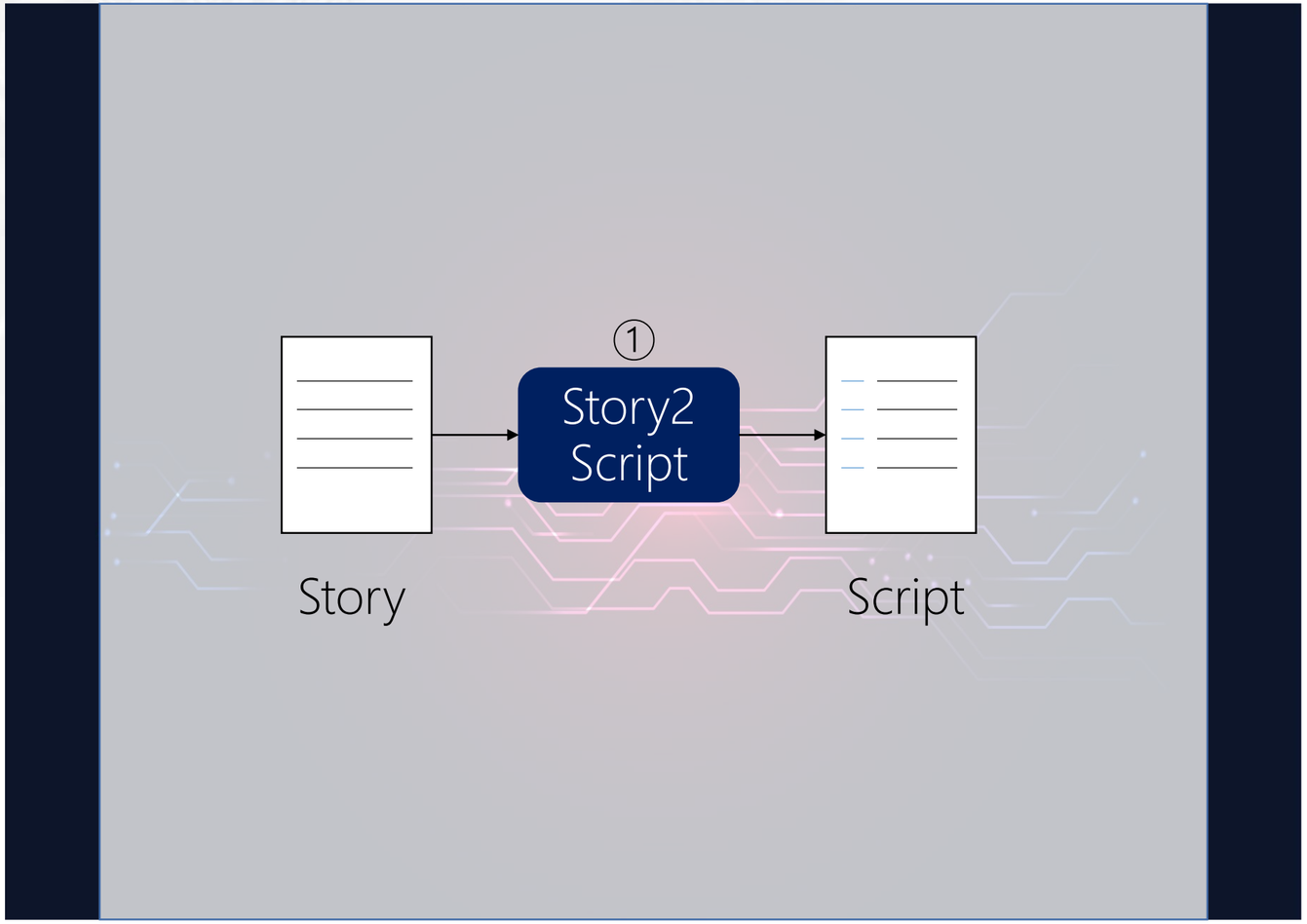
PART 3

# Why & How

# Story to Script



# Story to Script




## Why

- Manual labeling and copy-pasting
- Wastes time
- Error-prone

## How

✓ Natural Language Processing (NLP)
- Co-reference Resolution
- Semantic Role Labeling

✓ To extract speaker-utterance pairs

# Story to Script

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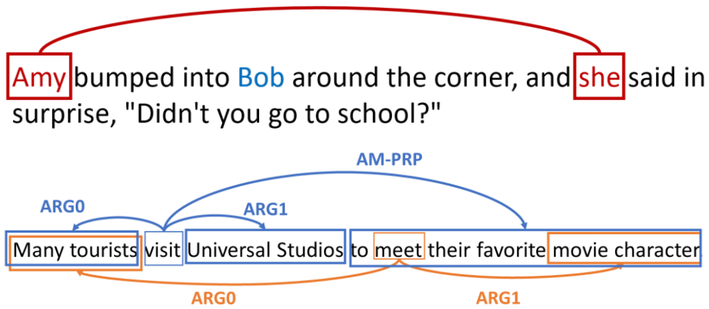
## Data Preparation

- Open Source Data
  - Co-Reference Resolution (CoRef)
  - Semantic Role Labeling (SRL)




2

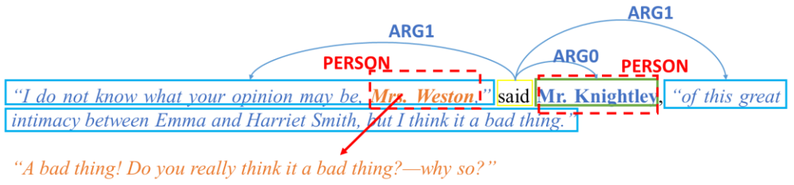
## Implementation

- Multitask BERT for
  - CoRef
  - SRL
- Rule-based Methods for no-speakers

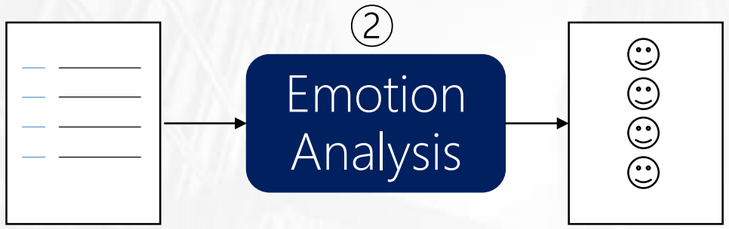
3

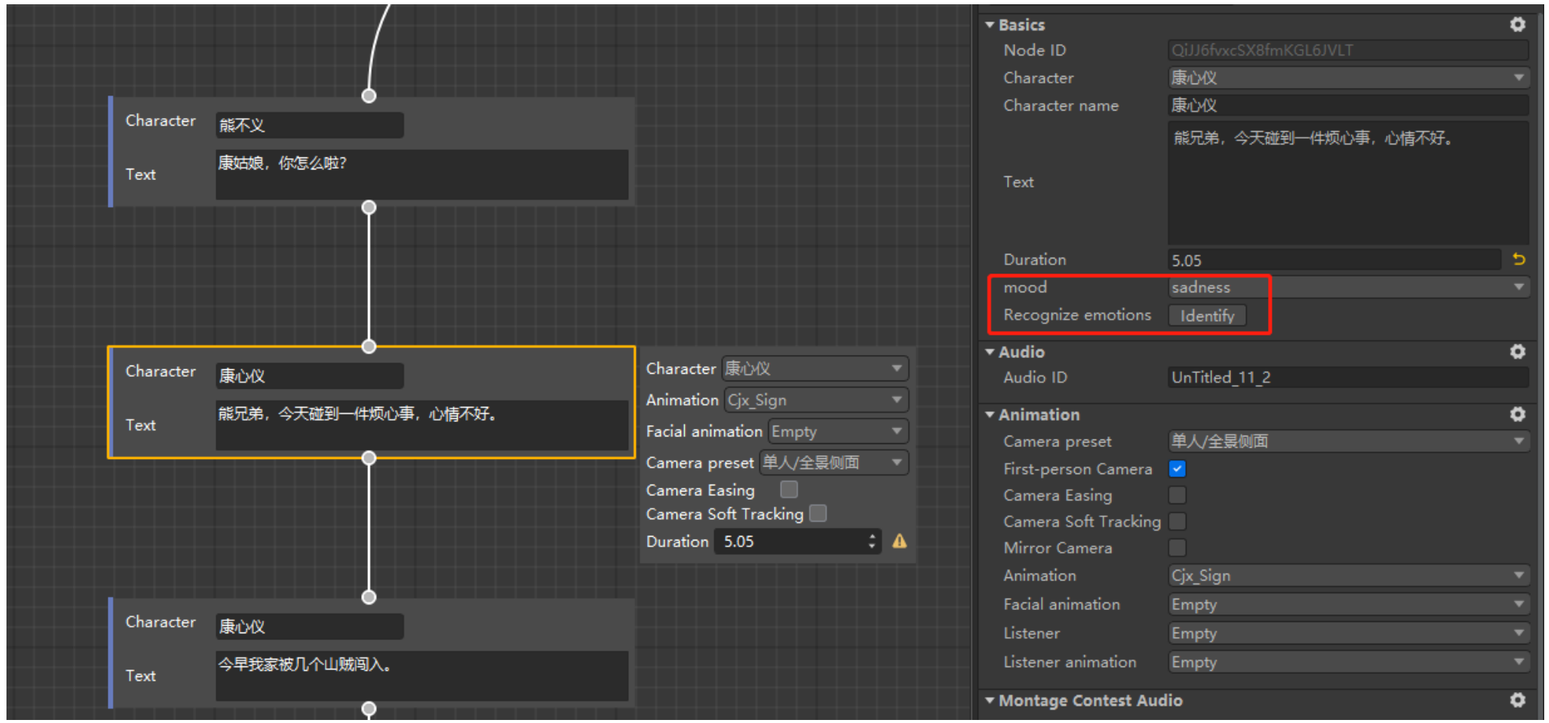
## Examples

- SPEAKER: CoRef and SRL
- No-SPEAKER: based on context



# Emotion Analysis



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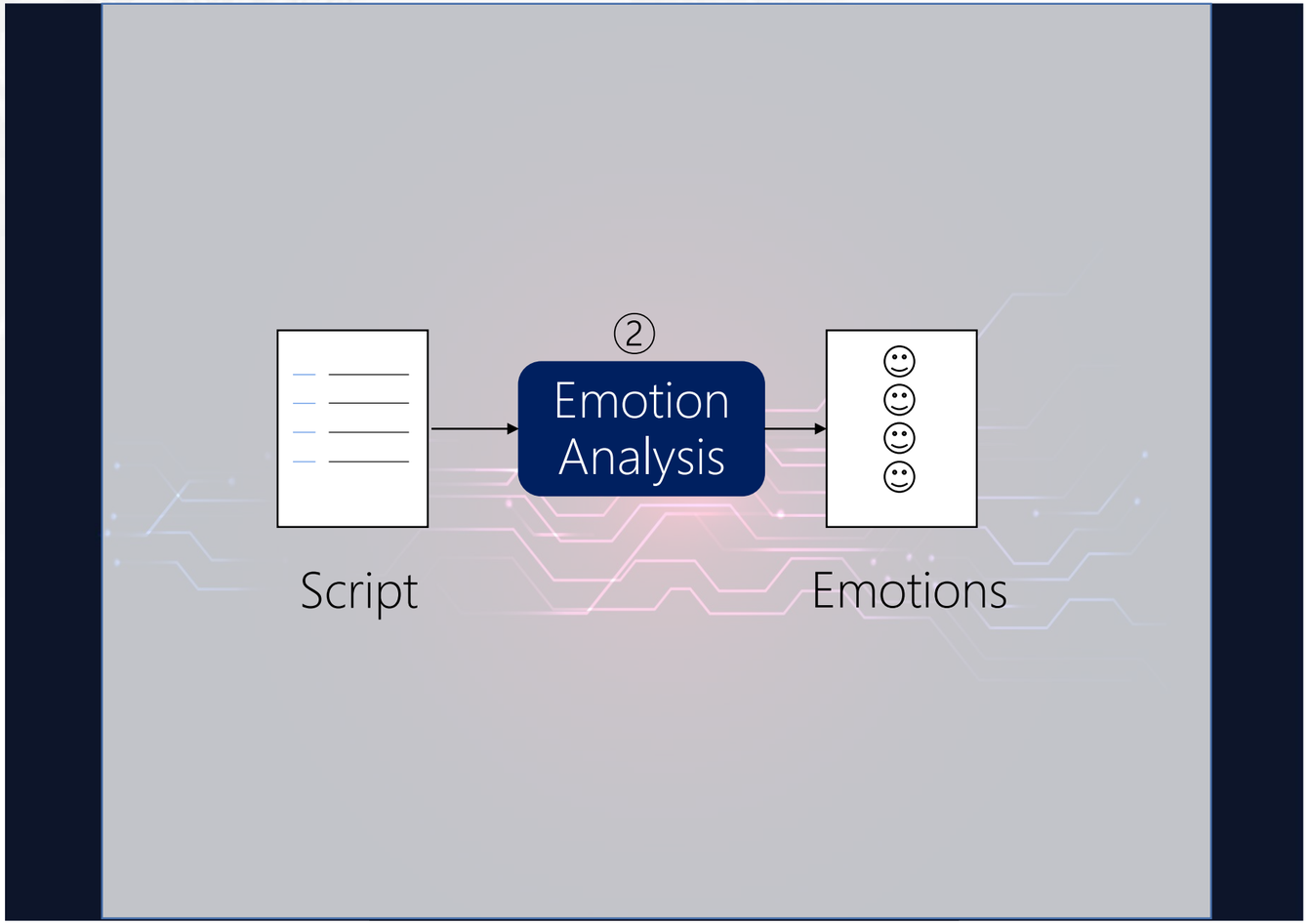


## Why

- Labeling emotions automatically
- Reduce the workload

## How

✓ BERT based on game script data.

✓ Classification Task

# Emotion Analysis

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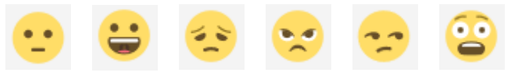
## Data Preparation

- 1000+ dialogues, about 10,000 utterances
- Manually labeling the emotion tags
- 

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## Implementation

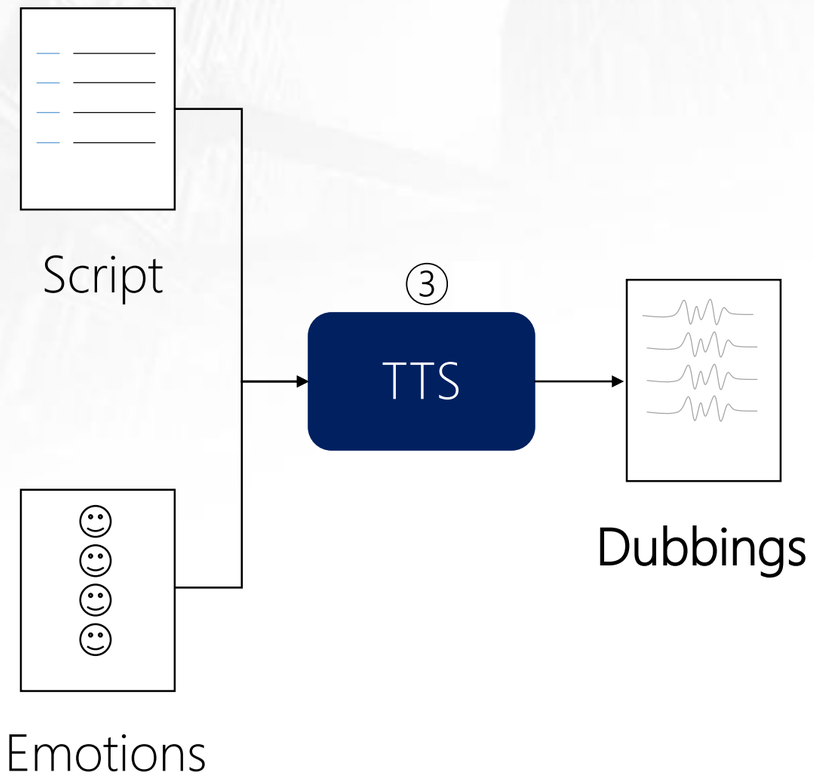
- BERT-based model
- Emotion with highest probability
- 1 * GTX 1080Ti, RAM 16G
- Around 2h training
- Inference: 0.06s per utterance

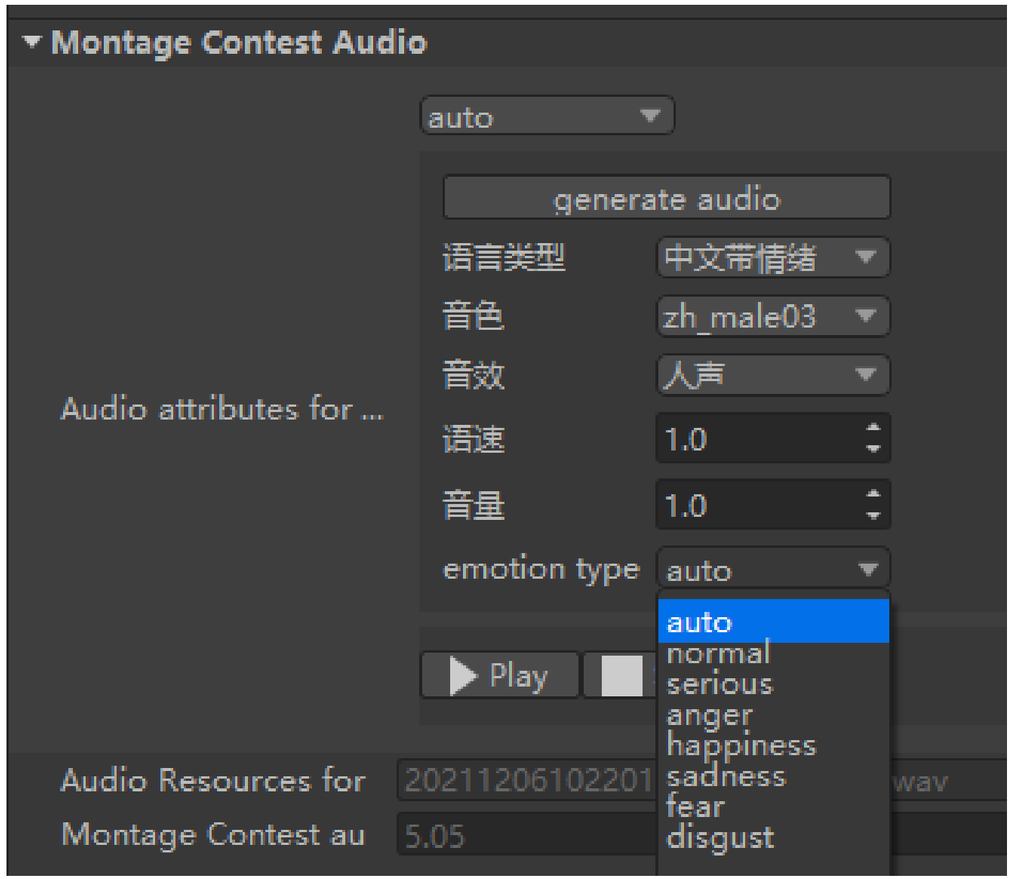
3

## Examples

| | | |
|---|---|---|
| ⋮ | | |
| Ivy | Hey, Cassandra! | Happiness 0.8912 |
| Cassandra | Ugh...you again. | Disgust 0.3859 |
| Cassandra | What is it Ivy? You didn't really get lost again, did you? | Normal 0.5468 |
| Ivy | I don't care what you say about me. | Anger 0.6656 |
| ⋮ | | |

# Text to Emotional Speech



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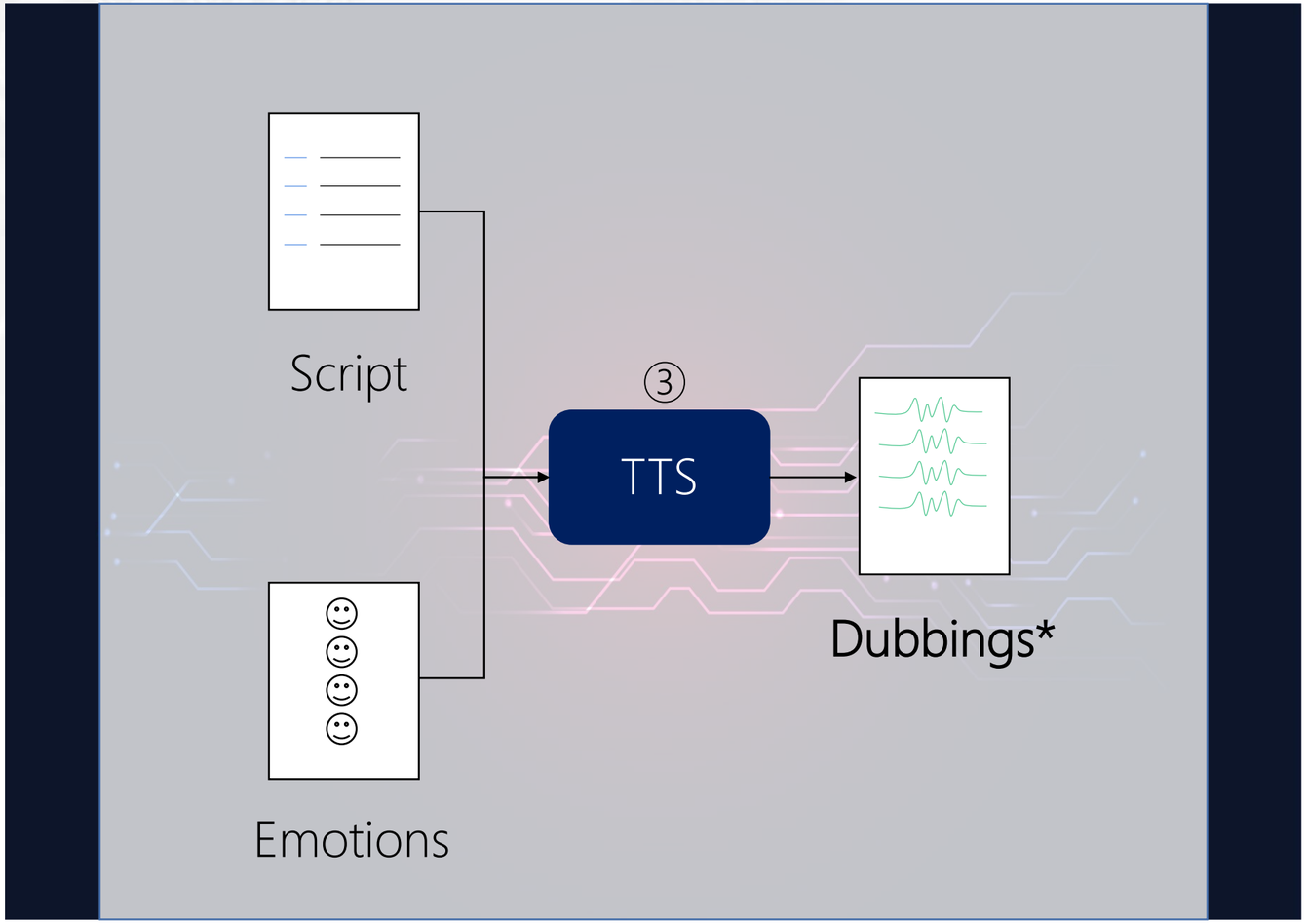


## Why

- Alternative resources
- Avoid blocking the process
- Flexible simulation

## How

✓ FastSpeech

✓ Optional other speech synthesis tools

# Text to Emotional Speech

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## Data Preparation

- 4 hour Single Speaker Emotional Corpus
- (Text, Speech, Emotion) triplet

---

- 50+ hour Multi-Speaker Speech Corpus
- 40 speakers
- (Text, Speech) pair

2

## Implementation

- Cross Speaker Prosodic Features Transfer
- Two-Stage Speech Synthesis
- 8*GTX2080TI, 3-4 days training
- Real time factor = 1

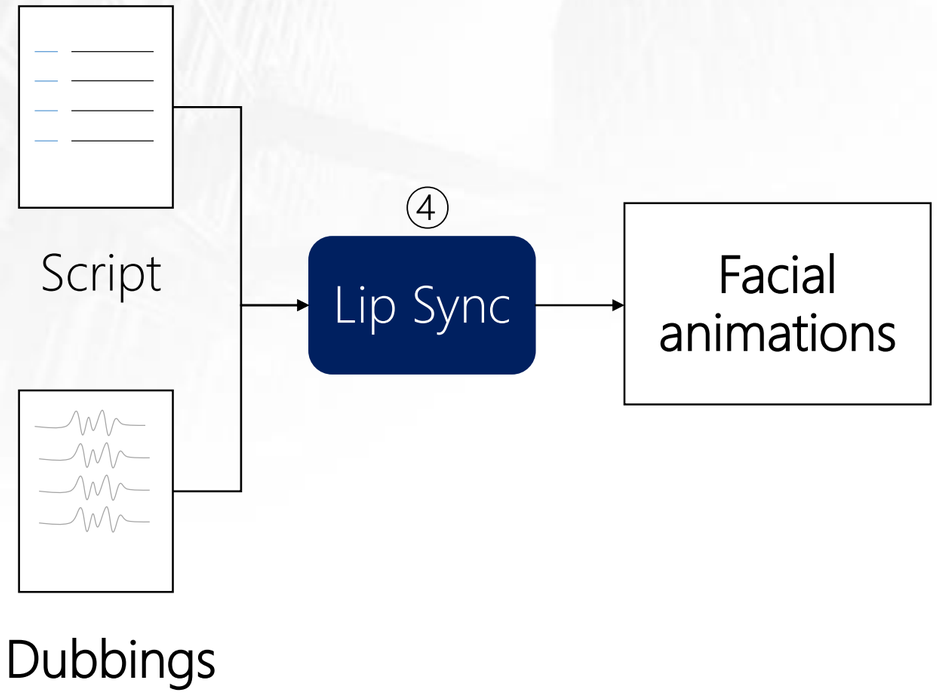
3

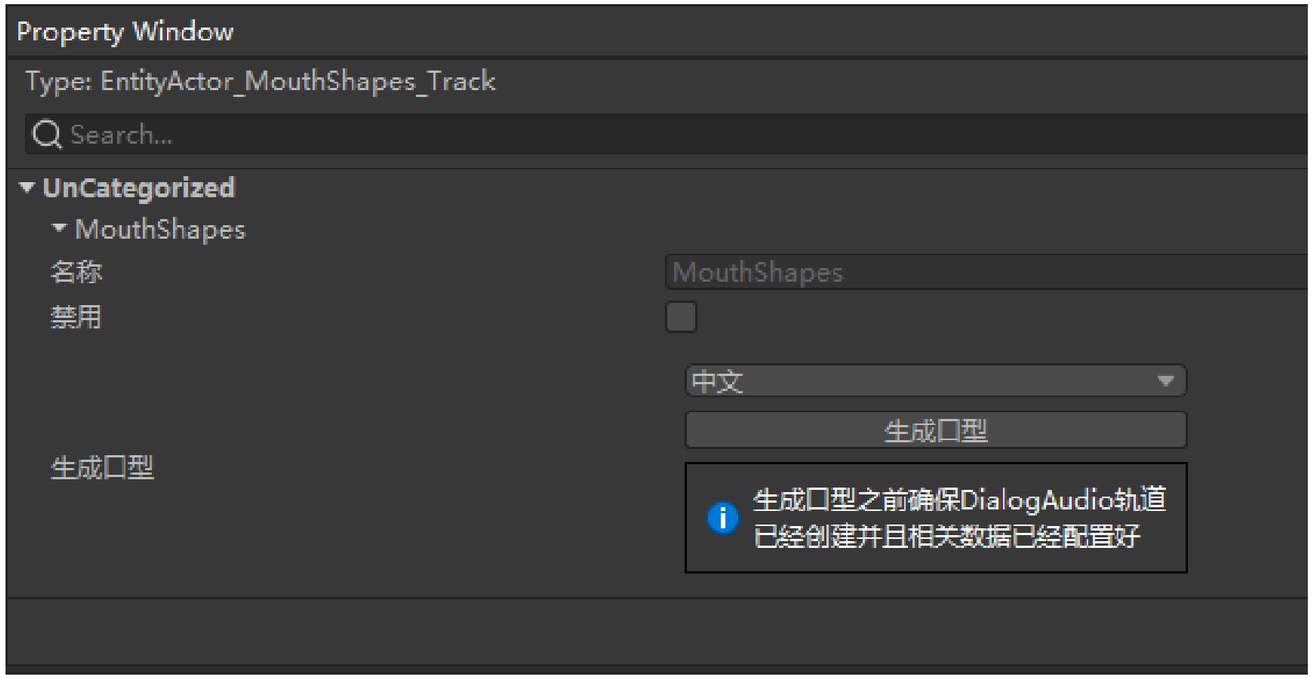
## Examples

Yeah, well, I saw the wreck and figured I'd help if I could.
是啊，我看到了车的残骸，想如果可以的话，我可以帮忙。

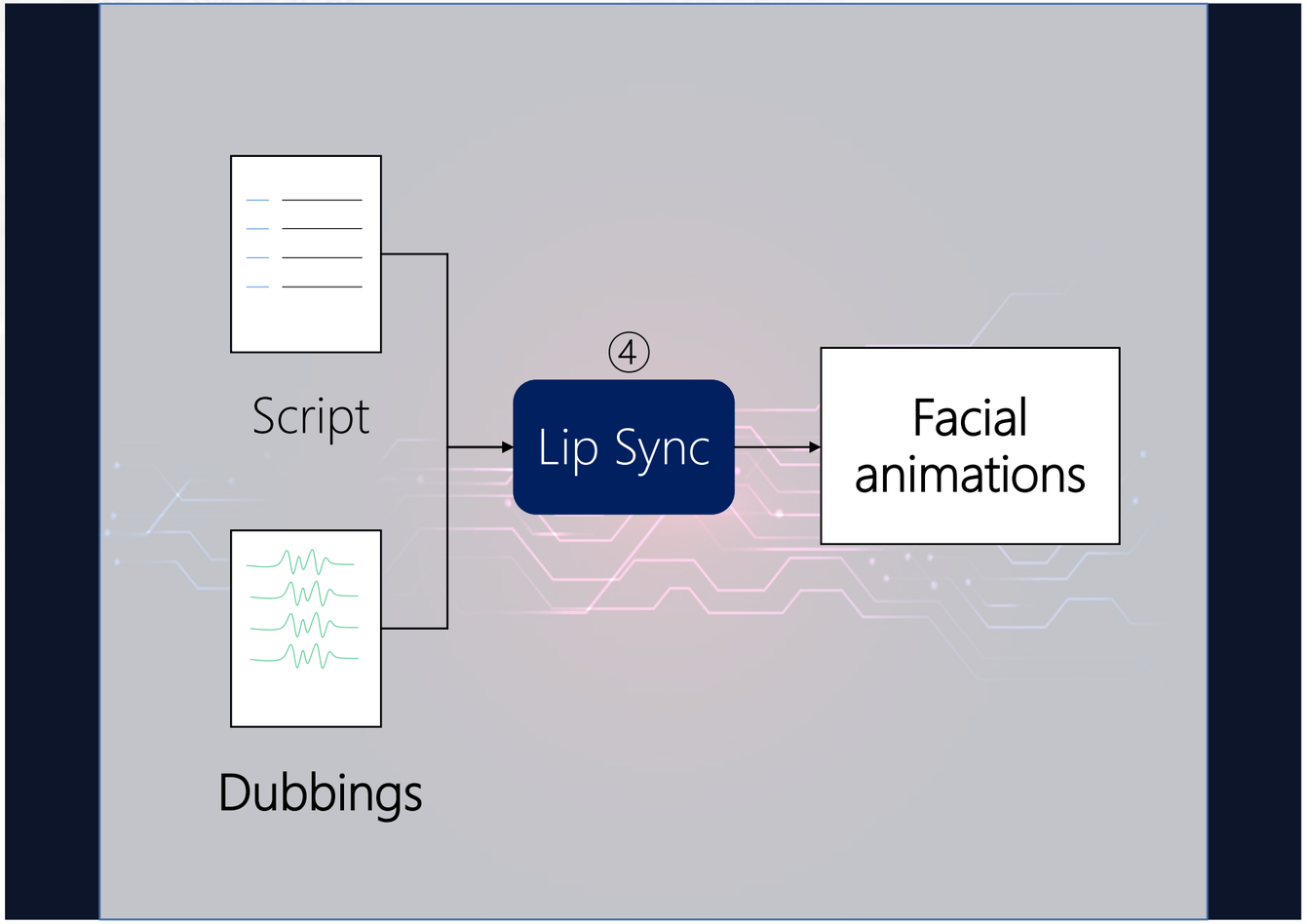
[Neutral] [Happy] [Fear]

# Facial Animation



# Facial Animation




## Why

- Auto-generate
- Reduce costs
- Enhance expressiveness

## How

✓ Force phoneme alignment

✓ Phonemes to visual visemes

✓ Optional: other speech animation algorithms

# Facial Animation

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## Data Preparation

- 960 hours Text-speech pair
- 10 to 17 viseme shape
- Phoneme to viseme settings

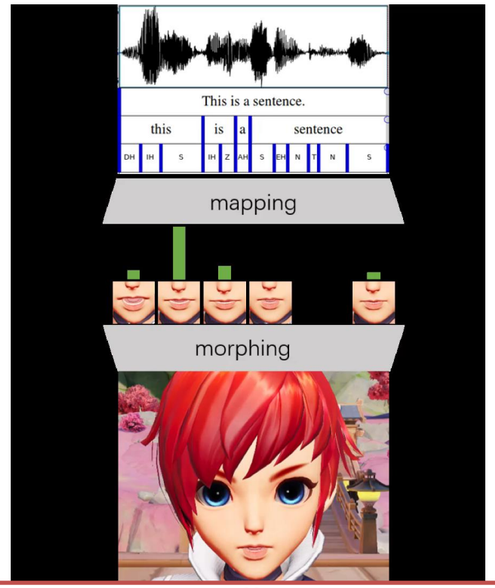
2

## Implementation

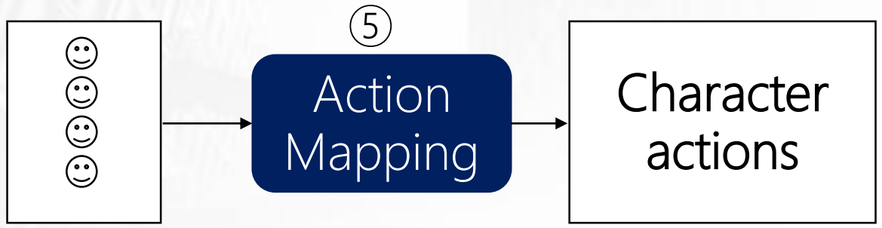
- Force phoneme alignment
- Phoneme to viseme mapping
- Viseme shape morphing
- Morphing weights filtering

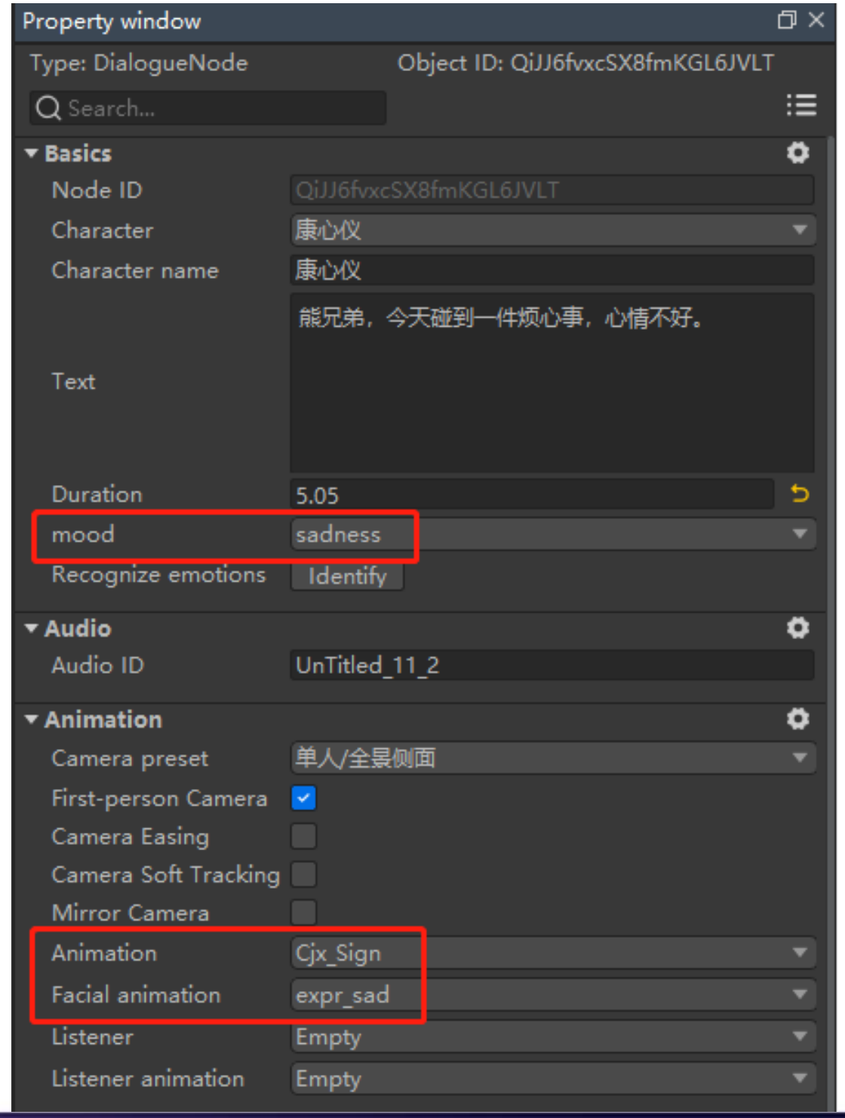
3

## Examples



# Action Mapping



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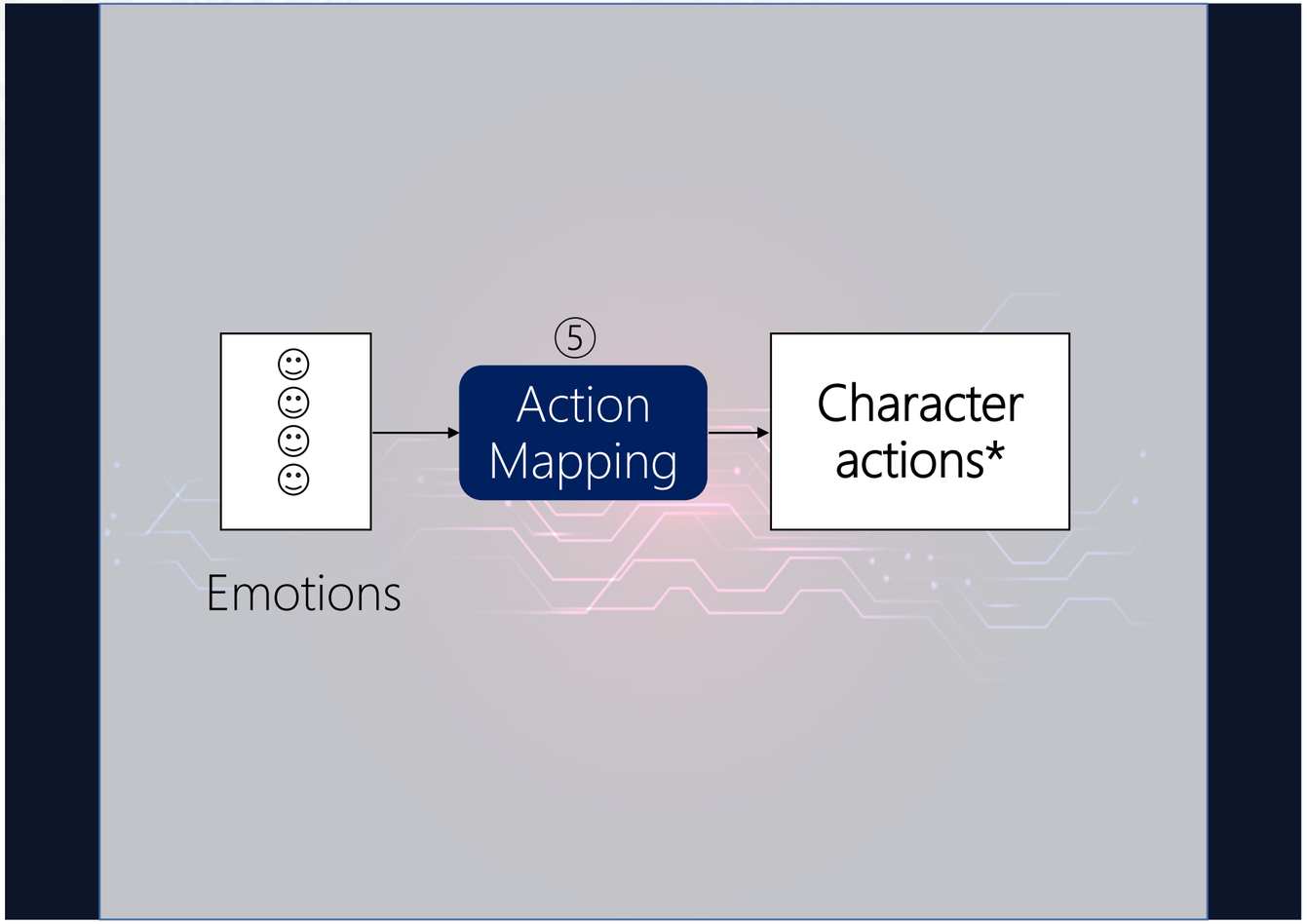


## Why

- Quickly mapping
- Enhance the expressiveness.

## How

✓ Many-to-many mapping

✓ Fusion method for transitioning

# Action Mapping

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## Data Preparation

- Prepared character animations
- Manually labeling emotions

| 名称 | 类型 | 路径 | 时长 | 源路径 | 标签 |
|---|---|---|---|---|---|
| Cjx_Laugh | SkeletonAnimation | Char/... | 2334 | /PT/Cj.. | happiness |
| Cjx_Sign | SkeletonAnimation | Char/... | 1867 | /PT/Cj.. | sadness |
| Cjx_Laugh | SkeletonAnimation | Char/... | 3001 | /STL/... | happiness |
| Cjx_Sign | SkeletonAnimation | Char/... | 2001 | /STL/... | sadness |
| Cjx_Laugh | SkeletonAnimation | Char/... | 2834 | /DT/C.. | happiness |
| Cjx_Sign | SkeletonAnimation | Char/... | 4167 | /DT/C.. | sadness |
| Cjx_Laugh | SkeletonAnimation | Char/... | 2767 | /HSS/... | happiness |
| Cjx_Sign | SkeletonAnimation | Char/... | 3534 | /HSS/... | sadness |

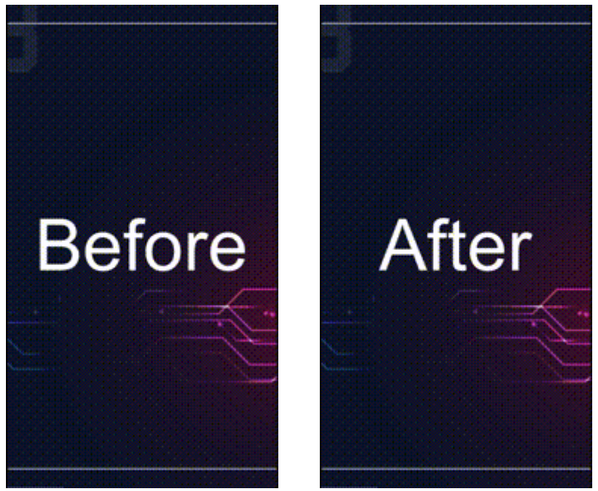
2

## Implementation

- Rule-based mapping algorithm
- One tag to multiple animations.
- Animation blending

3

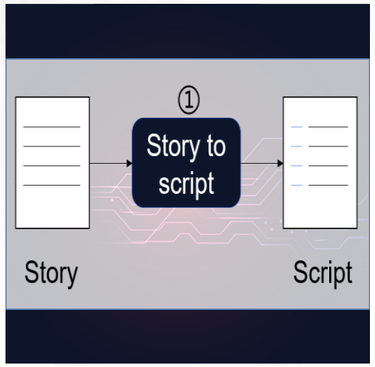
## Examples



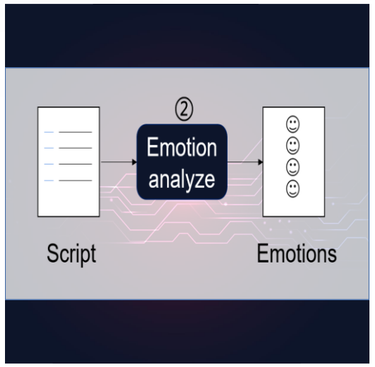
# PART 4
# Closing

# An Easy-to-Use Cutscenes Preview Tool

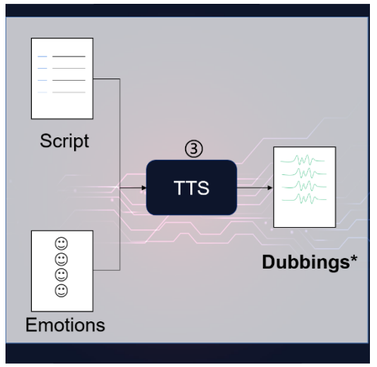
Game developers can more efficiently produce cutscene prototypes in the early stages of development , by using



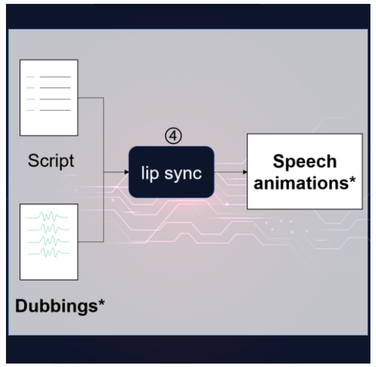

Story to Script technology



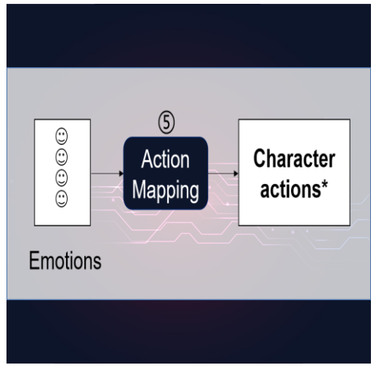

Script emotion analysis




Speech synthesis

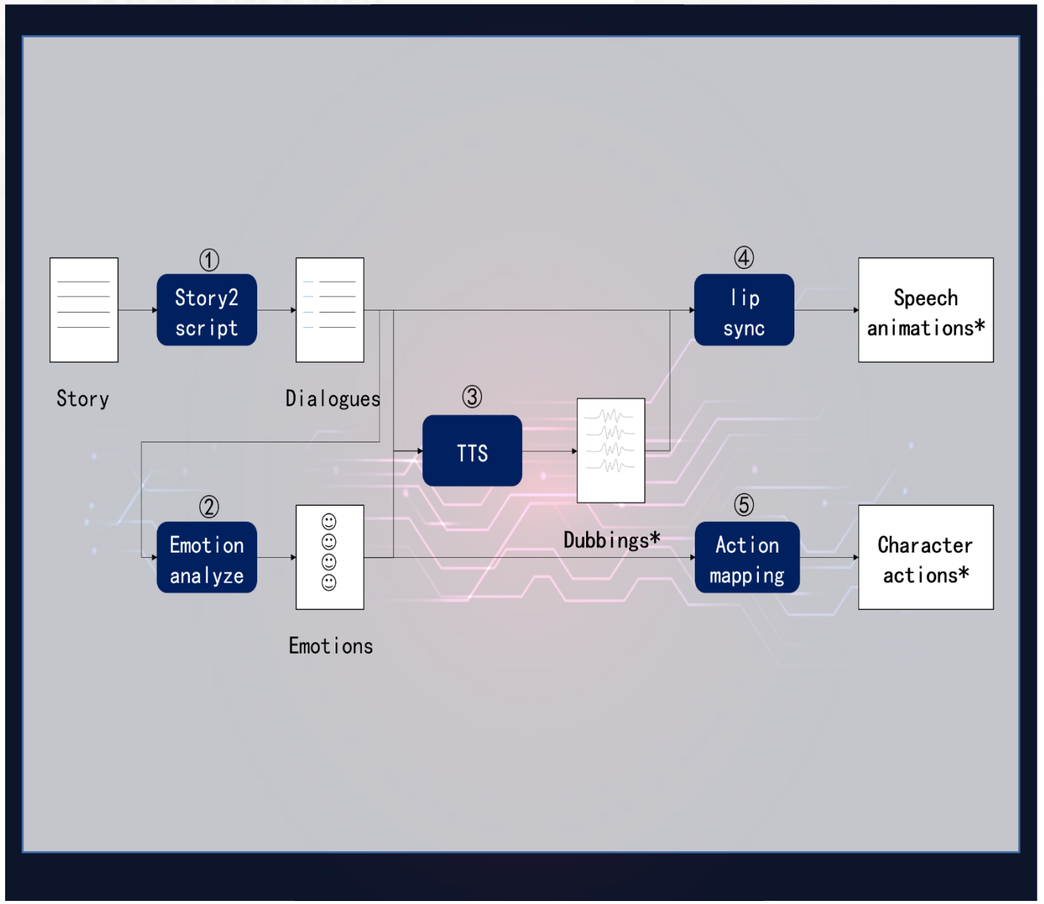



Speech animation generation




Emotional action mapping

# An Easy-to-Use Cutscenes Preview Tool




## Before

- Waste of manual resources
- Endless polish and disambiguation.
- Difficult for communication

## After

- Quick and automatic
- Reduce production time
- Better design communication

## Weakness

- Camera random setting
- Action mapping is not smart
- Emotion analysis is not detailed

# Acknowledgement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Editor Support:

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Resources Support:

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San Francisco,CA

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Overseas: https://www.neteasegames.com/careers

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