

# Green Research

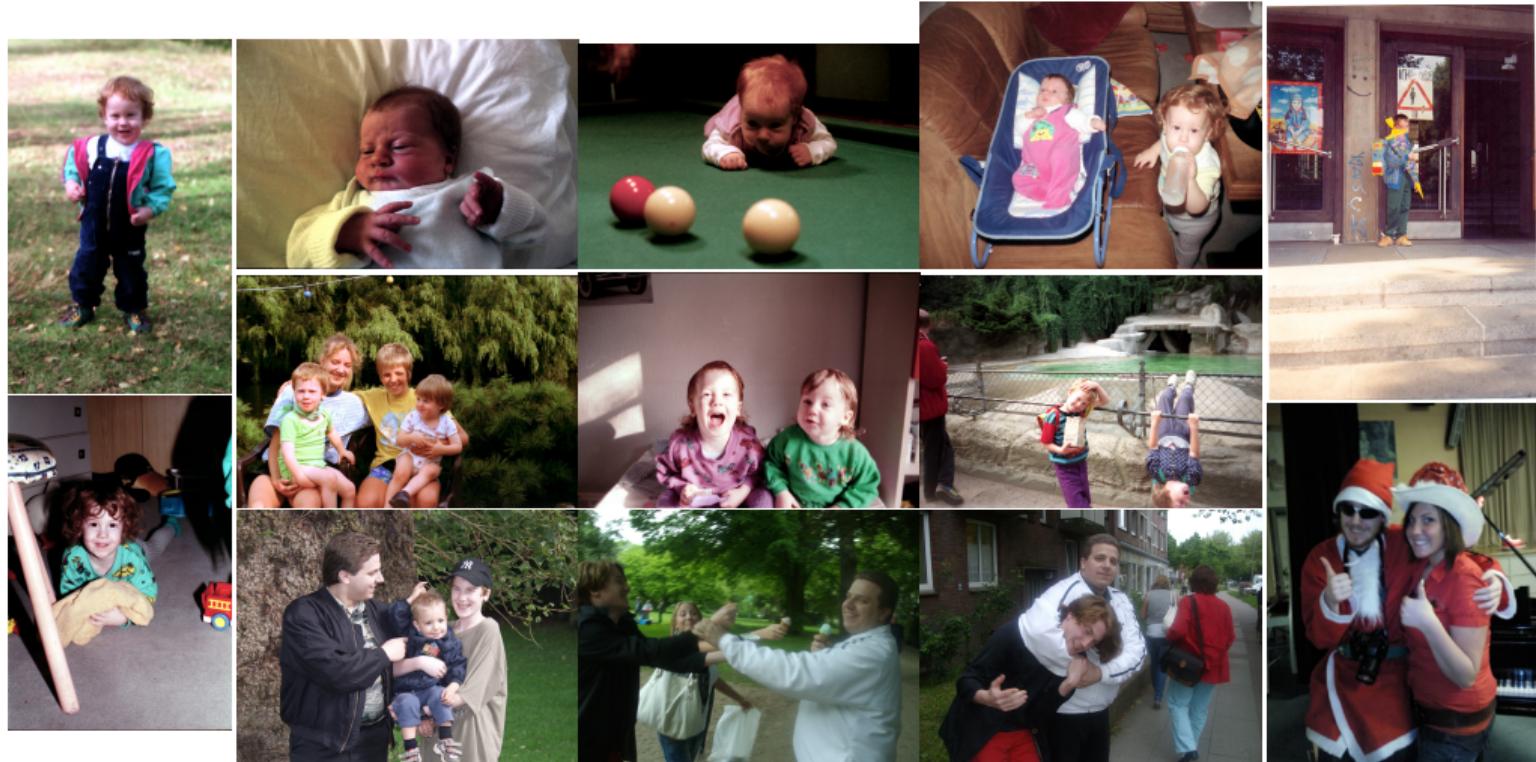
## Green as more than just a Color

Christian Schuler

Study Life & Projects  
University of Hamburg and beyond

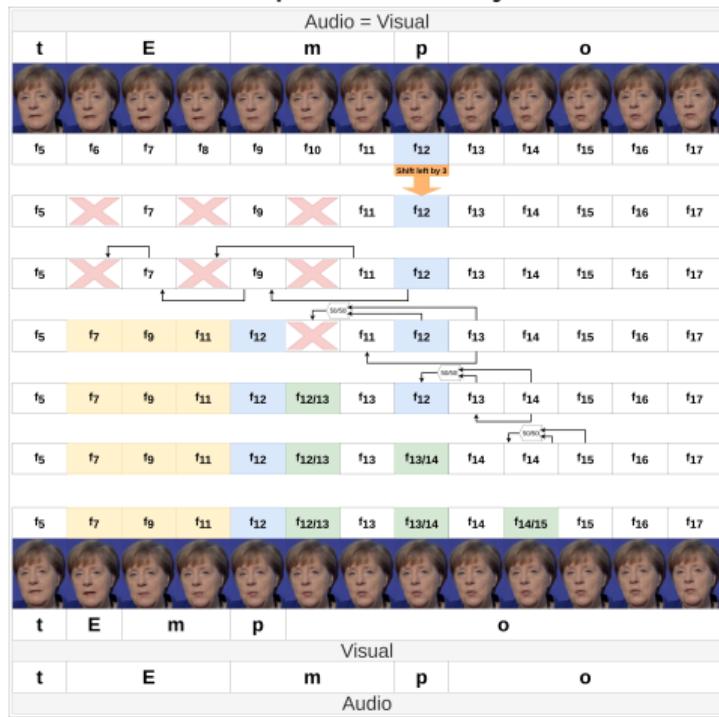
March 25, 2025

# Introduction - Growing Up In Hamburg



# Bachelor's Thesis (2022) I

## ■ Title: Perceptual Quality Assessment of Lip-Synchrony in Dubbing



Christian  
Schuler



Dr. Timo  
Baumann\*

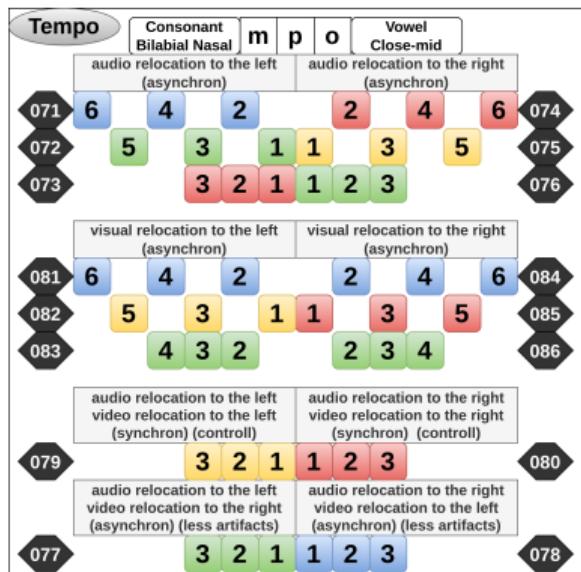


Prof. Timo  
Gerkmann

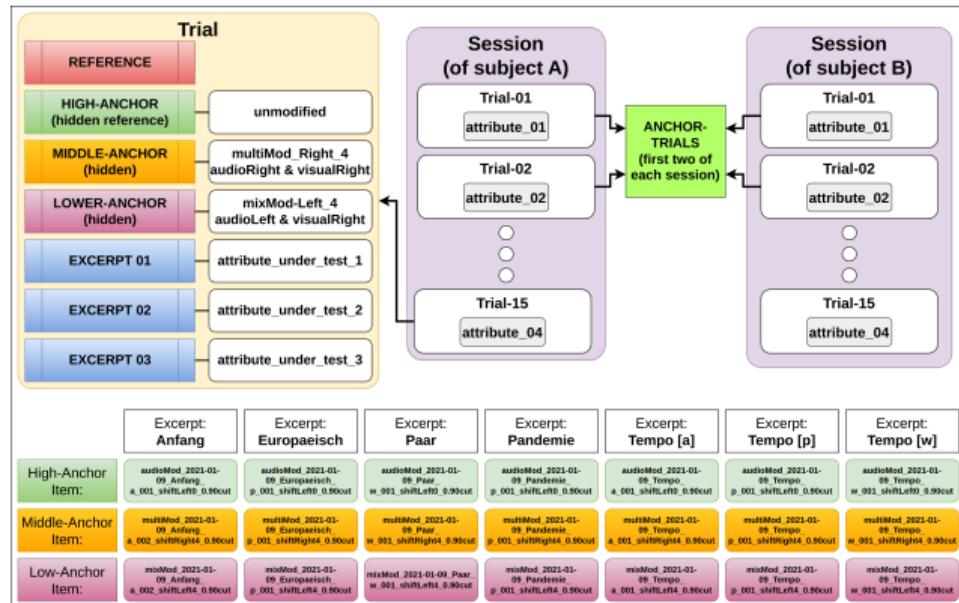
\* since 2022 Professor.

# Bachelor's Thesis (2022) II

## Study Setup



## Anchor Items



# Bachelor's Thesis Fallout I

- Natural Language Processing mit Neuronalen Netzen  
(Baumann and Schuler, 2022) Linux Article
- Lip-Synched  
(Baumann and Schuler, 2023) Linux Article



Christian



Timo

- StudyToolkitVid  
A toolkit for creating studies to evaluate quality of videos.



Christian & Dominik

# Bachelor's Thesis Fallout II

## Neural audio-visual synchrony evaluation

- A Deep Dive Into Neural Synchrony Evaluation for Audio-visual Translation  
(Nayak et al., 2022)



Shravan Christian Debjoy Timo

## Linguistic information in pauses

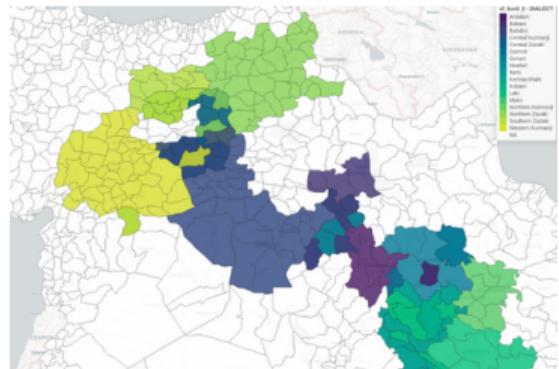
- Can We See Your Response Before You Speak? Exploring Linguistic Information Found in Inter-Utterance Pauses  
(Schuler et al., 2024)



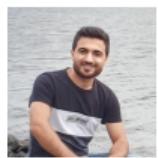
Christian Shravan Debjoy Timo

# Master's Thesis Build-up I

- Towards a Complete Mapping of Kurdish Dialectology (Schuler and Ahmad, 2023) Poster as ICKL6

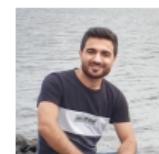
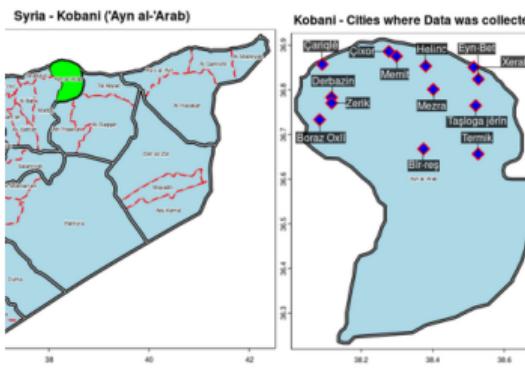


Christian



Raman

- Analysis of Phonology and Morphology in the Kobani Dialect (Ahmad and Schuler, 2023) Poster as ICKL6



Raman



Christian

# Master's Thesis Build-up II

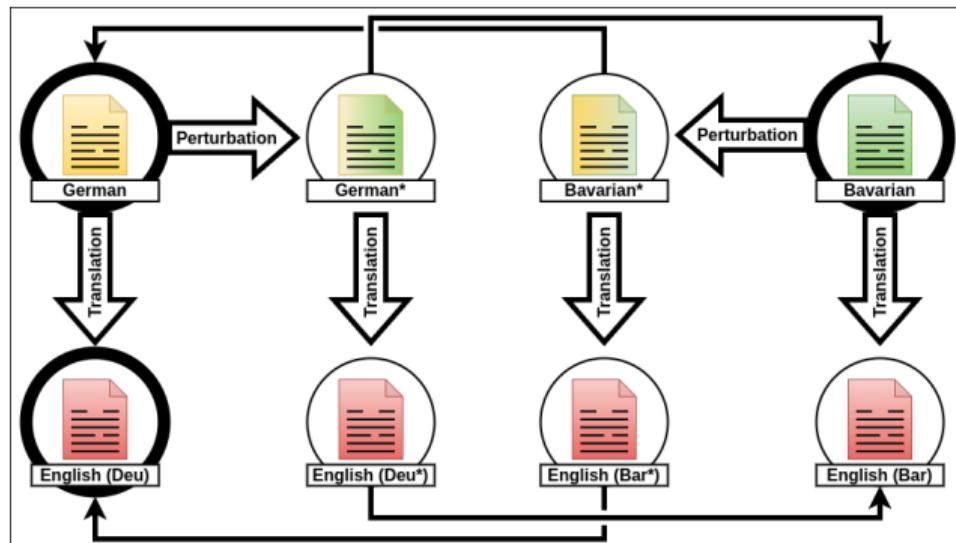
- MTACR - Multilingual Text As Corpus Repository



Tania, Christian, Myy, Raman

# Master's Thesis (2024) I

- Title: Leveraging Morphological and Lexical Features in Synthetic Data Generation for Dialect-Specific Machine Translation

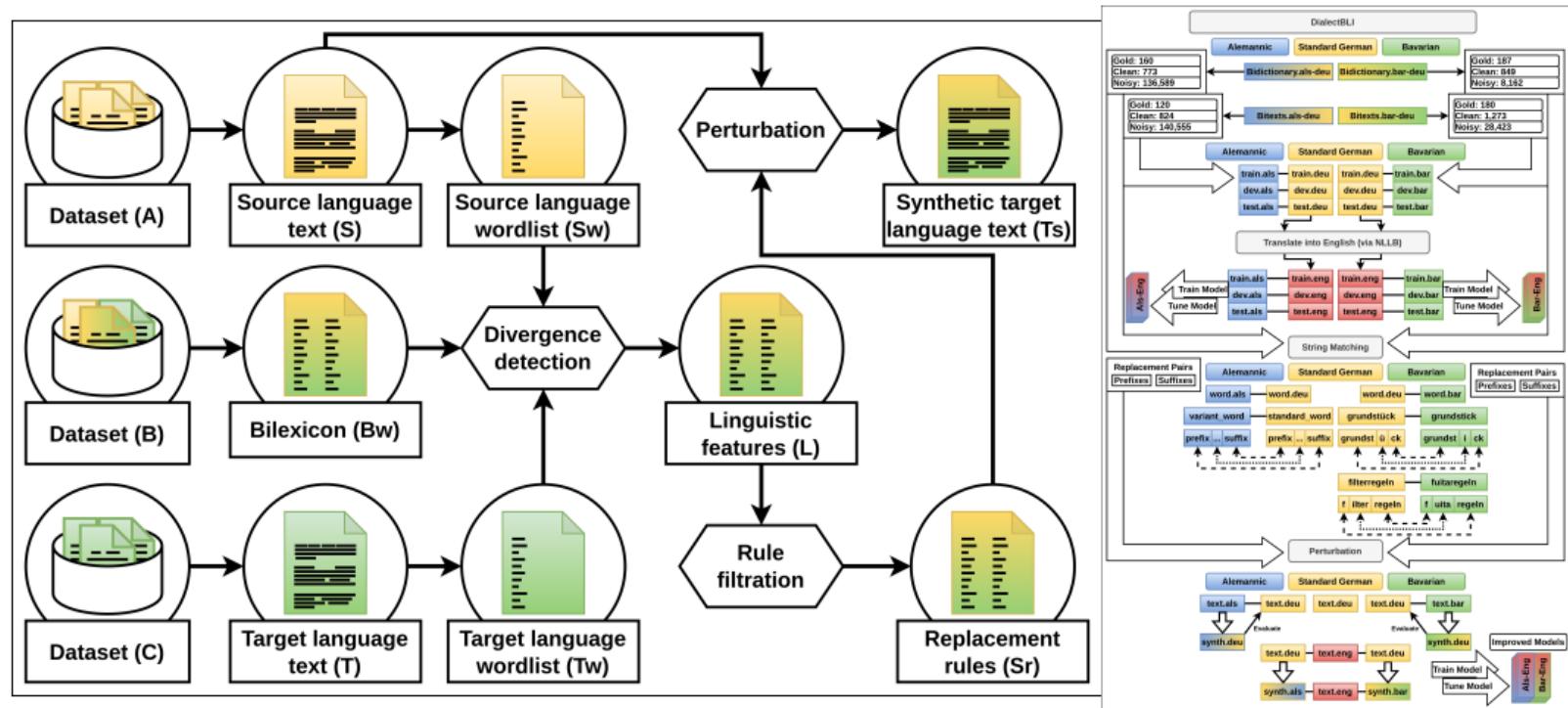


Christian Schuler      Dr. Sina Ahmadi

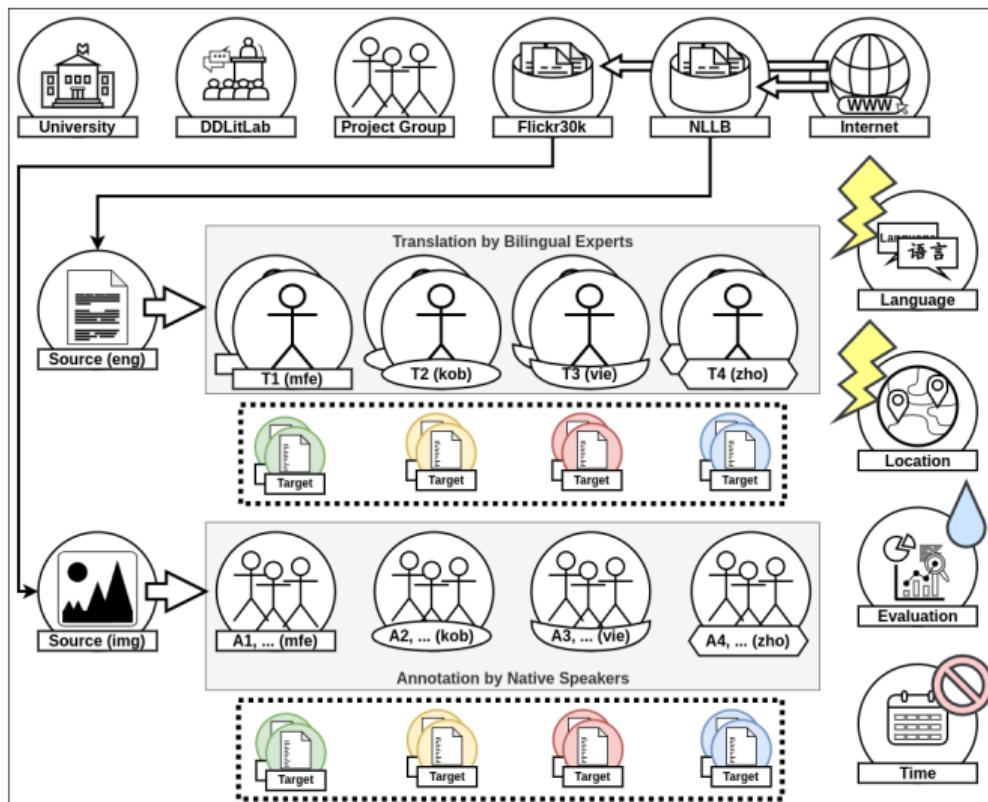


Dr. Seid Muhie Yimam Biemann      Prof. Chris Biemann

# Master's Thesis (2024) II



# MTACR I - Overview



# MTACR II - Motivation

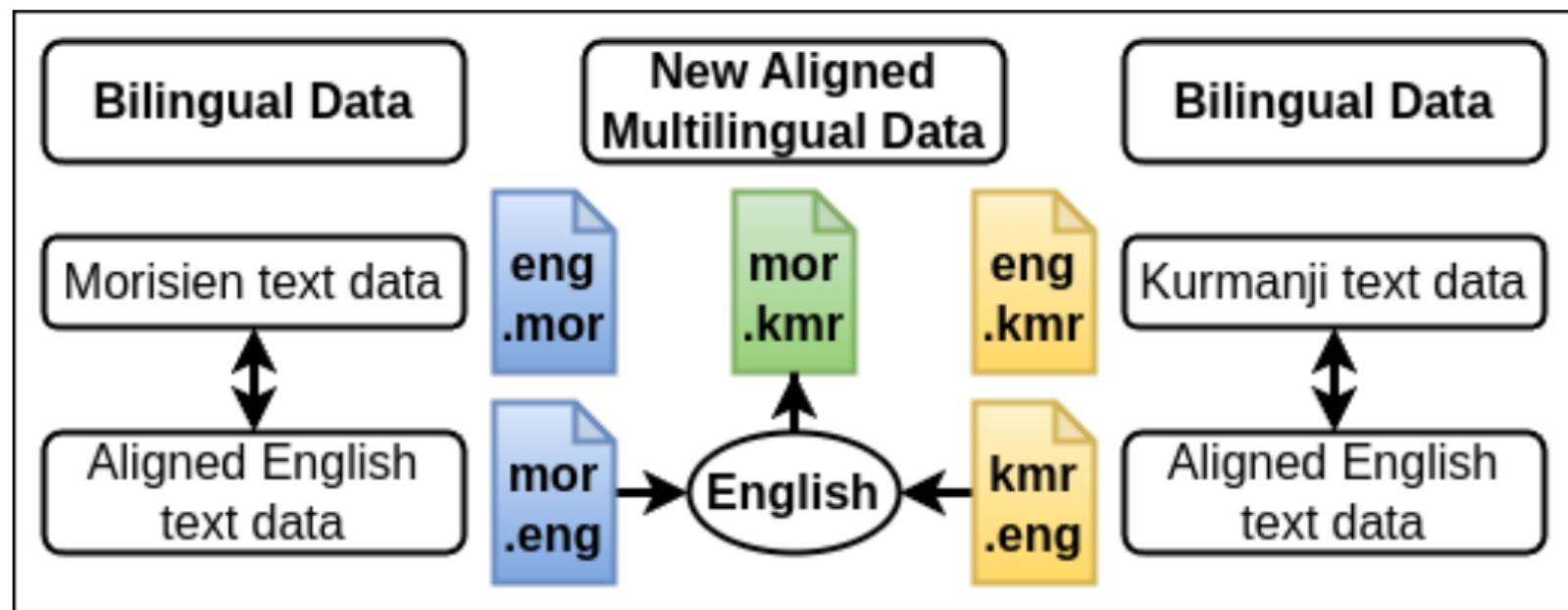
|  |   |
|--|---|
| German                                       | Ich mag die Farbe Grün, esse gerne Pizza, und meine Schwester wohnt in Österreich.  |
| English                                      | I like the color green, I like eating pizza, and my sister lives in Austria.   |
| Chinese                                      | 我喜欢绿色，我喜欢吃披萨，我姐姐住在奥地利   |
| Chinese (Pinyin)                             | Wǒ xǐhuān lǜsè, wǒ xǐhuān chī pīsà, wǒ jiějiě zhù zài àodìlì.    |
| Vietnamese                                   | Tôi thích màu xanh lá cây, tôi thích ăn pizza và chị gái tôi sống ở Áo.   |
|  | Tôi thích màu xanh, tôi thích ăn pizza và chị gái của tôi sống nước Áo.    |
| Kurdish<br><i>Sorani</i><br><i>Kurmanji?</i> | Ez ji rengê kesk hez dikim, ez ji xwarina pizza hez dikim, û xwişka min li Avusturya dijî.  |
|  | Ez ji rengê kesk hez dikim, ez ji xwarina pîzayê hez dikim, û xwişka min li Awistirayê dijî    |
| Morisien                                     | ...  Kobani ...  ~7000 more ...  |

Figure: Translation Systems (Here Google Translate) Failing Languages.

## MTACR III - Focus Languages



# MTACR IV - Pivot Languages



# MTACR V - Annotation Tasks with Potato Tool

Mô tả hình ảnh bằng tiếng  
Việt

test@test

.....

**LOGIN**

[Forgot Username / Password?](#)

[Login](#) → [Create your Account](#) →

- A. Projections are a subject of several pure mathematical fields, including differential geometry, projective geometry, and manifolds.  
B. Rather, any mathematical function that transforms coordinates from the curved surface distinctly and smoothly to the plane is a projection.  
C. The Earth and other large celestial bodies are generally better modeled as oblate spheroids, whereas small objects such as asteroids often have irregular shapes.

Please translate the 3 sentences from the above text one by one.

|        |                      |
|--------|----------------------|
| For A: | <input type="text"/> |
| For B: | <input type="text"/> |
| For C: | <input type="text"/> |

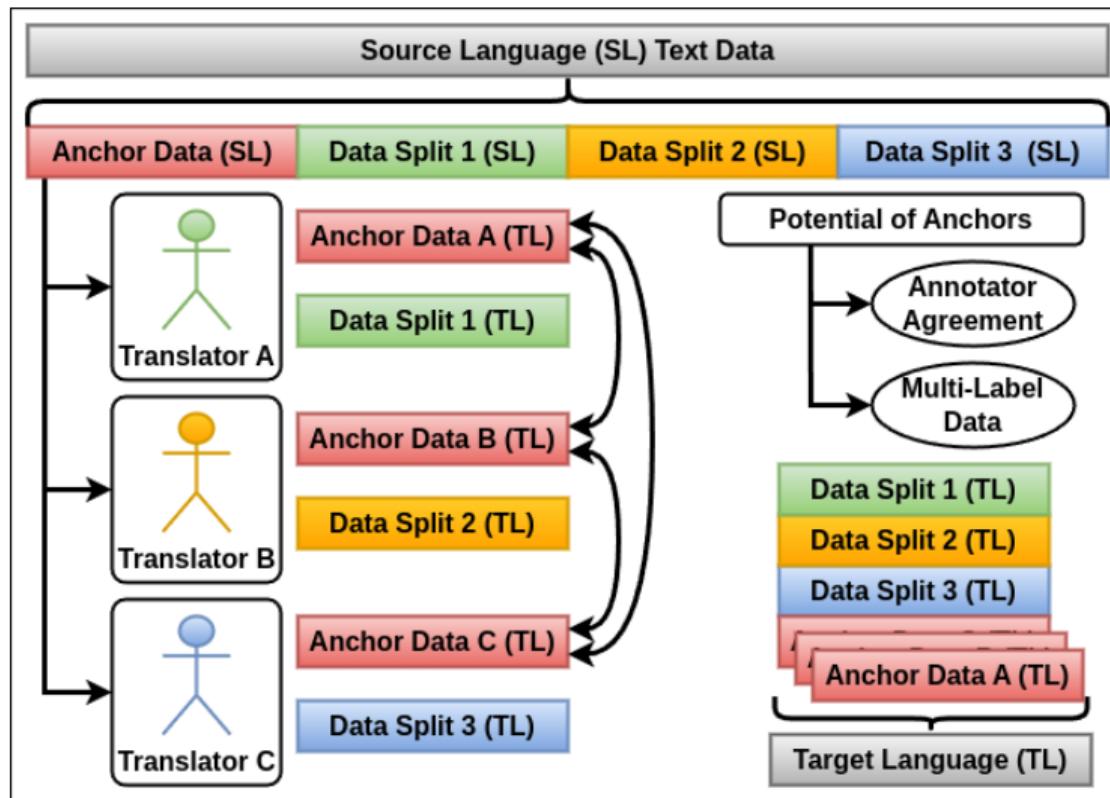


Hãy mô tả nội dung hình ảnh trong một câu và sử dụng tiếng Việt.

Sự miêu tả

Một người đàn ông mặc quần jeans, tóc nâu và đeo kính chơi ghi-ta

# MTACR VI - Anchor Items



# MTACR VII - Fun with Expert Translators

## 3 English sources

- "0293": "There must be something in my tone of voice, or this arrogant face—something that antagonizes everybody."
- "0294": "In spite of his success, Warner Bros. had no interest in raising Bogart's profile."
- "0295": "Bogart used these years to begin developing his film persona: a wounded, stoical, cynical, charming, vulnerable, self-mocking loner with a code of honor."

## 2 Vietnamese targets

- "0293": "Bất chấp thành công của mình, hãng Warner Bros. thể hiện ít sự quan tâm trong việc nâng cao vị thế của Bogart."
- "0294": ???
- "0295": "Bogart bắt đầu hình thành nhân vật điện ảnh của mình trong những năm này, chép tác một nhân vật bị tổn thương, khắc khổ, hoài nghi, quyến rũ, dễ bị tổn thương và tự chế giễu, nhưng duy trì một quy tắc danh dự."

## 1 English source

- "0040": "Lloyd and Roach parted ways in 1924, and Lloyd became the independent producer of his own films."

## 2 Vietnamese targets

- "0040": "Lloyd và Roach chia tay nhau vào năm 1924. Sau đó, Lloyd trở thành nhà sản xuất độc lập cho các bộ phim của riêng mình."
- "0040": "Lloyd và Roach đường ai lối khác vào năm 1924, và Lloyd bắt đầu tự sản xuất phim."

# Corpus Statistics (Flickr30k-based Data)

| Language   | #Sent  | Min/Avg/Max Sent | #Token (unique) | Min/Avg/Max Token   | Char (unique)  | CJK Ratio |
|--|--------|------------------|-----------------|---------------------|----------------|-----------|
| <b>MTACR</b>   |        |                  |                 |                     |                |           |
| Morisien   | 169    | 3 / 8.73 / 20    | 1476 (509)      | 1.00 / 4.08 / 40.00 | 7326 (53)      | N/A       |
| Vietnamese   | 563    | 3 / 8.77 / 34    | 4940 (896)      | 1.00 / 3.43 / 11.00 | 21338 (119)    | N/A       |
| Chinese  | 326    | 4 / 13.22 / 32   | 4309 (649)      | 1.00 / 1.00 / 1.00  | 4309 (649)     | 1.0       |
| Kobani   | 193    | 2 / 9.32 / 26    | 1798 (624)      | 1.00 / 4.24 / 14.00 | 9221 (57)      | N/A       |
| <b>Expansion of Flickr30k by previous publications</b> |        |                  |                 |                     |                |           |
| Ukrainian  | 29847  | 2 / 9.32 / 36    | 278072 (27791)  | 1.00 / 5.52 / 26.00 | 1783635 (155)  | N/A       |
| Czech  | 31014  | 2 / 9.05 / 33    | 280756 (31269)  | 1.00 / 4.92 / 22.00 | 1632401 (102)  | N/A       |
| French   | 31014  | 3 / 12.48 / 43   | 387071 (17563)  | 1.00 / 4.73 / 21.00 | 2186649 (98)   | N/A       |
| Brazilian  | 155070 | 3 / 13.39 / 57   | 2075655 (31511) | 1.00 / 4.71 / 21.00 | 11692809 (118) | N/A       |
| Japanese   | 155066 | 1 / 29.70 / 187  | 4605660 (2465)  | 1.00 / 1.00 / 1.00  | 4605660 (2465) | 0.97      |
| English  | 186084 | 2 / 12.21 / 78   | 2272077 (34369) | 1.00 / 4.23 / 30.00 | 11695581 (90)  | N/A       |
| Dutch  | 2014   | 1 / 9.76 / 26    | 19654 (3556)    | 1.00 / 4.66 / 23.00 | 109228 (74)    | N/A       |
| Chinese  | 155064 | 3 / 21.09 / 141  | 3269702 (3441)  | 1.00 / 1.00 / 1.00  | 3269702 (3441) | 0.97      |
| German   | 31014  | 1 / 11.12 / 39   | 344856 (25854)  | 1.00 / 5.44 / 36.00 | 2189117 (98)   | N/A       |

# Corpus Statistics (NLLB-based Data)

| Language                                      | #Sent | Min/Avg/Max Sent | #Token (unique) | Min/Avg/Max Token    | Char (unique)  | CJK Ratio |
|---|-------|------------------|-----------------|----------------------|----------------|-----------|
| <b>MTACR</b>                                  |       |                  |                 |                      |                |           |
| Morisien                                      | 472   | 5 / 25.40 / 82   | 11990 (3571)    | 1.00 / 5.10 / 30.00  | 72671 (96)     | N/A       |
| Vietnamese                                    | 7795  | 5 / 31.32 / 117  | 244108 (15036)  | 1.00 / 3.59 / 27.00  | 1113026 (272)  | N/A       |
| Chinese                                       | 301   | 13 / 40.92 / 162 | 12318 (1154)    | 1.00 / 1.00 / 1.00   | 12318 (1154)   | 0.93      |
| Kobani  | 244   | 5 / 21.91 / 70   | 5345 (2544)     | 1.00 / 5.01 / 29.00  | 31870 (98)     | N/A       |
| <b>Created by Machine Translation Systems</b> |       |                  |                 |                      |                |           |
| Morisien                                      | 15522 | 1 / 24.63 / 381  | 393910 (36195)  | 1.00 / 4.71 / 41.00  | 2235173 (222)  | N/A       |
| Ukrainian                                     | 25204 | 1 / 18.52 / 67   | 466772 (81652)  | 1.00 / 6.33 / 305.00 | 3394792 (306)  | N/A       |
| Vietnamese                                    | 19975 | 1 / 31.33 / 351  | 870104 (23655)  | 1.00 / 3.57 / 306.00 | 3950079 (345)  | N/A       |
| Kurmanji                                      | 19110 | 1 / 23.13 / 202  | 441959 (53750)  | 1.00 / 4.98 / 597.00 | 2622341 (310)  | N/A       |
| Sorani  | 12626 | 1 / 20.00 / 309  | 252502 (45967)  | 1.00 / 5.92 / 147.00 | 1734599 (567)  | N/A       |
| Czech   | 25107 | 1 / 18.79 / 56   | 471857 (59511)  | 1.00 / 5.99 / 32.00  | 3271820 (236)  | N/A       |
| French  | 25204 | 2 / 24.76 / 86   | 624006 (38404)  | 1.00 / 5.52 / 498.00 | 4045579 (222)  | N/A       |
| Japanese                                      | 25108 | 8 / 70.63 / 1234 | 1773259 (2738)  | 1.00 / 1.00 / 1.00   | 1773259 (2738) | 0.83      |
| Russian                                       | 6481  | 3 / 19.10 / 59   | 123818 (40083)  | 1.00 / 6.71 / 31.00  | 947807 (211)   | N/A       |
| English                                       | 6193  | 5 / 22.02 / 62   | 136371 (26649)  | 1.00 / 5.42 / 33.00  | 869822 (207)   | N/A       |
| Tamil   | 6481  | 1 / 16.24 / 51   | 105245 (34399)  | 1.00 / 8.47 / 75.00  | 989929 (771)   | N/A       |
| Italian                                       | 240   | 8 / 22.20 / 44   | 5329 (1013)     | 1.00 / 5.72 / 18.00  | 35555 (87)     | N/A       |
| Friesisch                                     | 6193  | 4 / 22.22 / 65   | 137618 (27979)  | 1.00 / 5.60 / 39.00  | 902486 (204)   | N/A       |
| Chinese                                       | 28554 | 5 / 42.26 / 514  | 1219428 (3266)  | 1.00 / 1.00 / 1.00   | 1219428 (3266) | 0.94      |
| German  | 25204 | 3 / 21.40 / 68   | 539246 (54054)  | 1.00 / 6.41 / 46.00  | 3968958 (225)  | N/A       |
| Kobani  | 144   | 1 / 21.69 / 73   | 8417 (3800)     | 1.00 / 5.12 / 44.00  | 51107 (268)    | N/A       |
| Luxembourgish                                 | 6337  | 2 / 21.58 / 65   | 136729 (30127)  | 1.00 / 6.07 / 45.00  | 960476 (208)   | N/A       |

# Corpus Statistics (NLLB-based Data - MT in Detail)

| System     | zho  | ces  | eng  | fra  | fry  | deu  | ita | jap  | kob | kmr  | ltz  | mfe  | rus  | ckb  | tam  | ukr  | vie  |
|------------|------|------|------|------|------|------|-----|------|-----|------|------|------|------|------|------|------|------|
| ModernMT,  | 48   | 48   | -    | 48   | -    | 48   | -   | 48   | -   | 48   | 48   | -    | 48   | 48   | 48   | 48   | 48   |
| Niutrans   | 48   | 48   | -    | 48   | -    | 48   | -   | 48   | -   | 48   | 48   | 48   | 48   | 48   | 48   | 48   | 48   |
| Google     | 6193 | 6193 | -    | 6193 | 6193 | 6193 | -   | 6193 | -   | 6193 | 6193 | 6193 | 6193 | 6193 | 6193 | 6193 | 6193 |
| Tower      | 48   | 48   | -    | 48   | -    | 48   | 48  | 48   | 48  | 48   | 48   | 48   | 48   | 48   | 48   | 48   | 48   |
| Bing       | 48   | -    | -    | -    | -    | -    | -   | -    | -   | 48   | -    | 48   | -    | 48   | 48   | 48   | 48   |
| Systran    | 48   | 47   | -    | 48   | -    | 48   | 48  | 48   | -   | -    | -    | -    | -    | -    | 48   | 48   | 48   |
| Tilde      | -    | 48   | -    | 48   | -    | 48   | 48  | 48   | -   | 48   | -    | -    | 48   | 48   | 48   | 48   | 48   |
| DeepSeek   | 48   | -    | -    | 48   | -    | 48   | -   | -    | 48  | 48   | -    | 48   | -    | -    | -    | 48   | 48   |
| Argos      | 6193 | 6193 | -    | 6193 | -    | 6193 | -   | 6193 | -   | -    | -    | -    | -    | -    | -    | 6193 | -    |
| Perplexity | 48   | 48   | -    | 48   | -    | 48   | 48  | 48   | -   | 48   | -    | 48   | 48   | -    | -    | -    | 48   |
| Kimi       | 48   | -    | -    | 48   | -    | 48   | -   | -    | 48  | 48   | -    | 48   | -    | -    | -    | 48   | 48   |
| NLLB       | 6193 | 6193 | -    | 6193 | -    | 6193 | -   | 6193 | -   | 6193 | -    | -    | -    | 6193 | -    | 6193 | 6193 |
| DeepL      | 48   | 48   | -    | 48   | -    | 48   | 48  | 48   | -   | -    | -    | -    | 48   | -    | -    | 48   | -    |
| Marian     | 6193 | 6193 | -    | 6193 | -    | 6193 | -   | 6193 | -   | -    | -    | 6193 | -    | -    | -    | 6193 | 6193 |
| Claude     | 2616 | -    | -    | -    | -    | -    | -   | -    | -   | 3370 | -    | 427  | -    | -    | -    | -    | 741  |
| Translitz  | 48   | -    | -    | -    | -    | -    | -   | -    | -   | 48   | -    | -    | -    | -    | -    | -    | 48   |
| ChatGPT    | 686  | -    | -    | -    | -    | -    | -   | -    | -   | 2922 | -    | 2421 | -    | -    | -    | -    | 175  |
| Reference  | -    | -    | 6193 | -    | -    | -    | -   | -    | -   | -    | -    | -    | -    | -    | -    | -    | -    |

# Bilingual Lexicon Induction

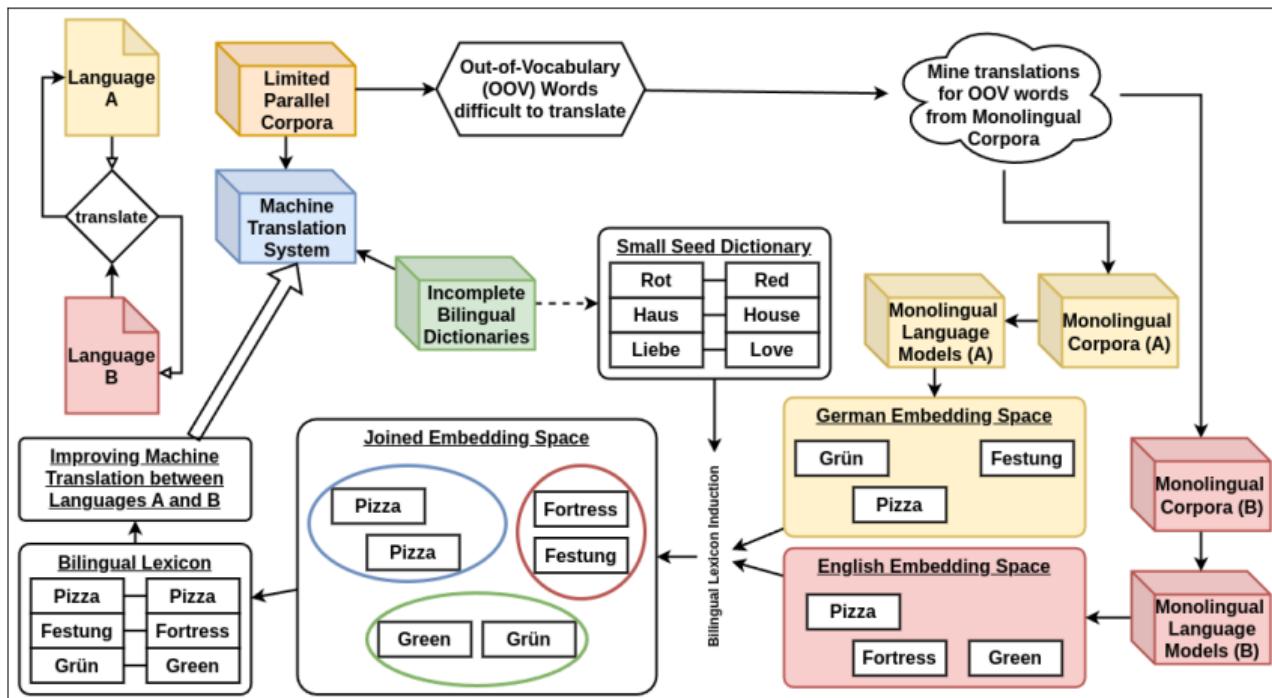
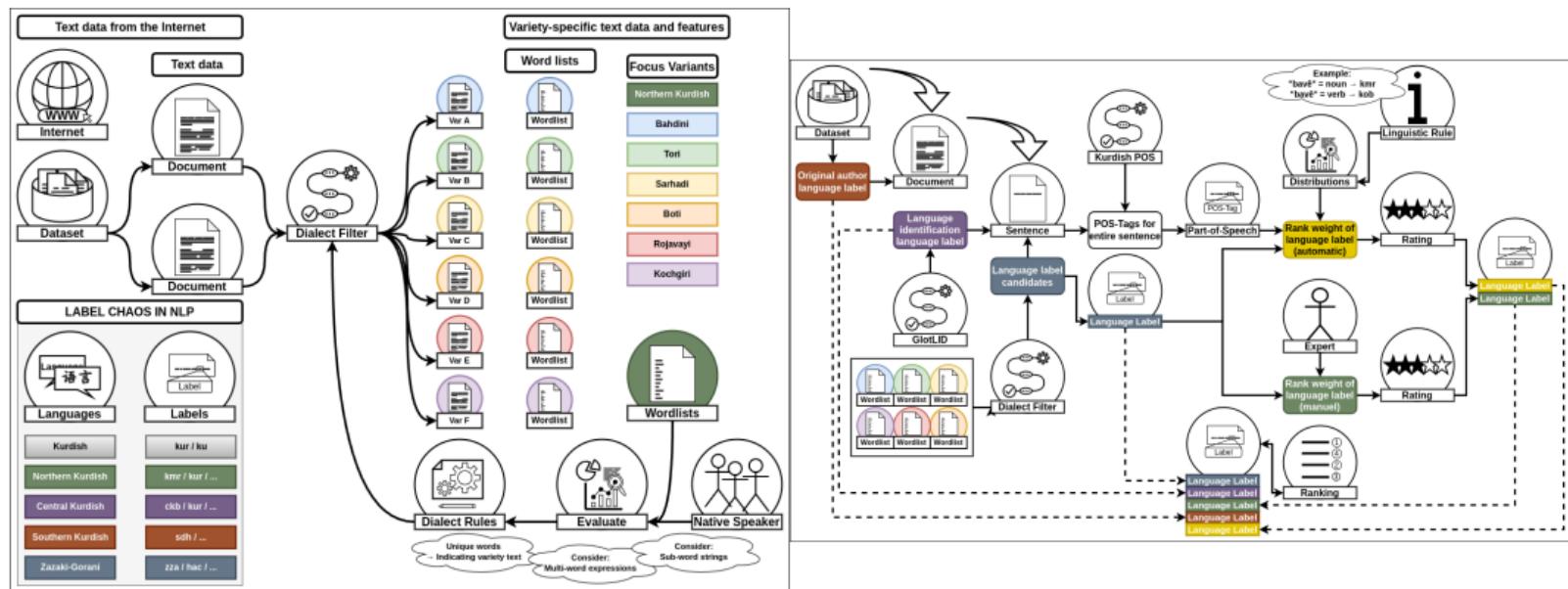


Figure: Inspiration for this figure: (Wang et al., 2021) and (Irvine and Callison-Burch, 2017).

# Dialect Filters - Dialect (Multi-)Labels



# La Ende

Open for questions (and cake?) !

# References |

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- Schuler, C. and Ahmad, R. (2023). Towards a complete mapping of kurdish dialectology.
- Schuler, C., Nayak, S., Saha, D., and Baumann, T. (2024). Can we see your response before you speak? exploring linguistic information found in inter-utterance pauses. page 8396 KB.

# Example I: Flickr30k-0001



## Kobani

- "mêrkek bi kombrêsê erdê xerab dikê"

## Morisien

- "enn missier p craze simin avec so machine craz roche"

## Vietnamese

- "Một công nhân xây dựng đang làm việc với một búa khoan."

- "Anh ấy đang phá dỡ đường"

## Chinese

- "一名工人正在拆除房屋前面的水泥路面"

# Example II: NLLB-0001

## English (Original Text)

- "Lillian Diana Gish (October 14, 1893 – February 27, 1993) was an American actress, director and screenwriter."

## Morisien

- "Lillian Diana Gish (inn ne 14 Oktob 1893 – inn mor 27 Fevrie 1993) li ti enn akter, enn realizater ek enn senaris Amerikenn."
- "Lillian Diana Gish (14 Oktob 1893 - 27 Fevriye 1993) ti enn aktris, realizatris ek senarist amerikenn."

## Vietnamese

- "Lillian Diana Gish, sinh ngày 14 tháng 10 năm 1893 và mất ngày 27 tháng 2 năm 1993, là một nữ diễn viên, đạo diễn và biên kịch người Mỹ."
- "Lillian Diana Gish (14/10/1893 – 27/2/1993) là một nữ diễn viên, đạo diễn, biên kịch người Mỹ."
- "Lillian Diana Gish (14/10/1893 – 27/02/1993) là một nữ diễn viên, đạo diễn và nhà biên kịch người Mỹ."

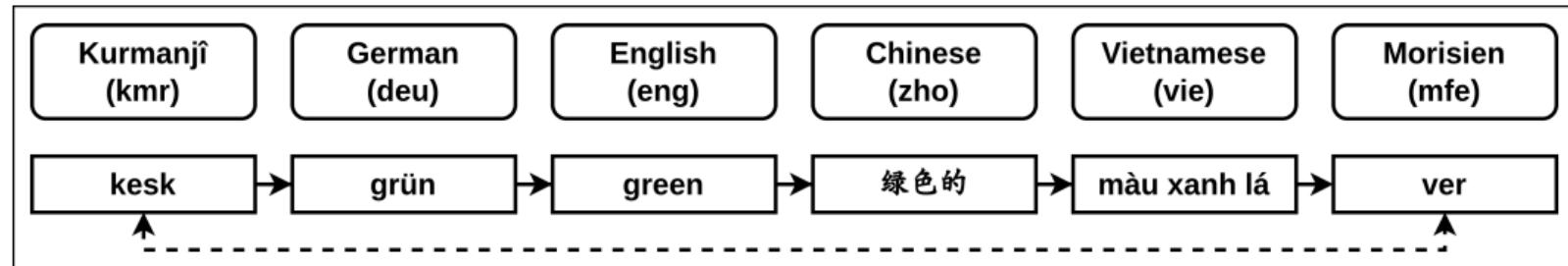
## Kobani

- "Lillian Diana Gish (14'î mehê 10'an 1893 - 27'î mehê didîyan 1993) lîstikvan, derhêner û sînaronivîseke Emrîkî bû."
- "Lilian Diana Gish (14î meha dehan, 1893 - 27î meha didiyan , 1993) lîstikvan, derhêner, û senarîsteke Emrîkî bû."

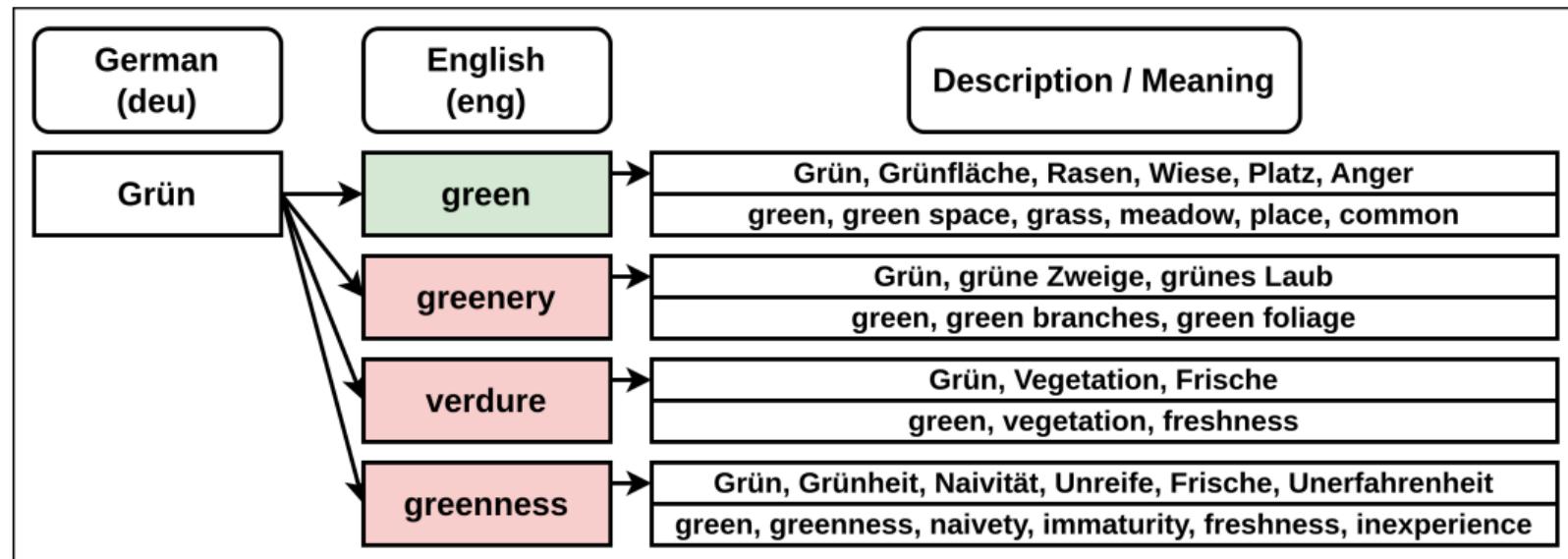
## Chinese

- "莉莲·戴安娜·吉什（1893年10月14日-1993年2月27日），美国女演员、导演和编剧。"
- "莉莲·戴安娜·吉什（1893年10月14日—1993年2月27日）是一位美国女演员、导演和编剧。"
- "莉莉安·黛安娜·吉许（1893年十月十四日-1993年二月27日）是一个美国演员，导演和编剧。"

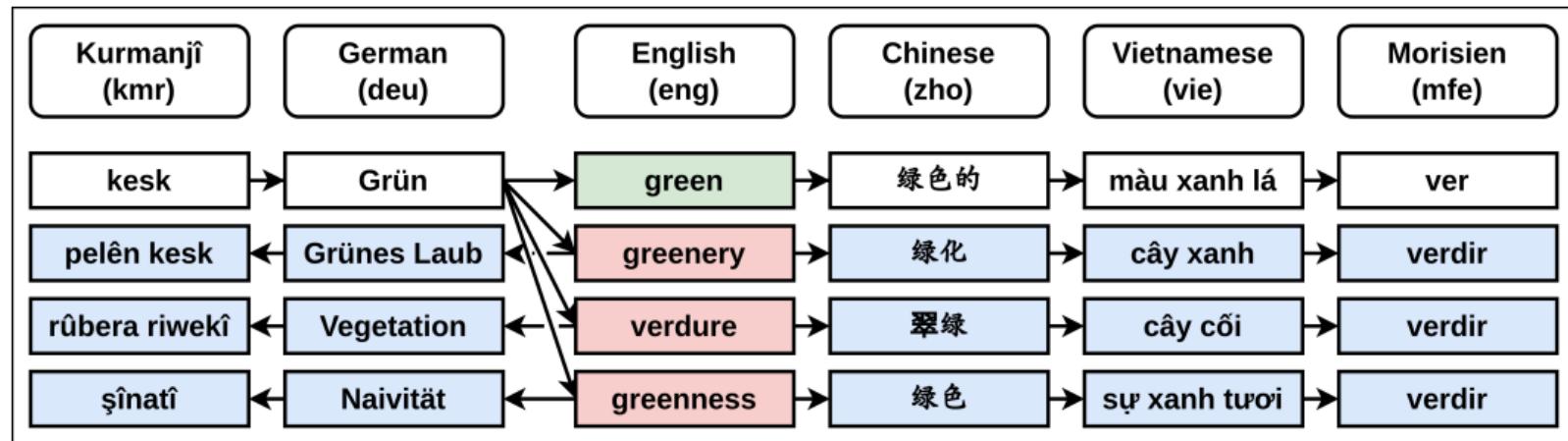
# Language Ambiguity I



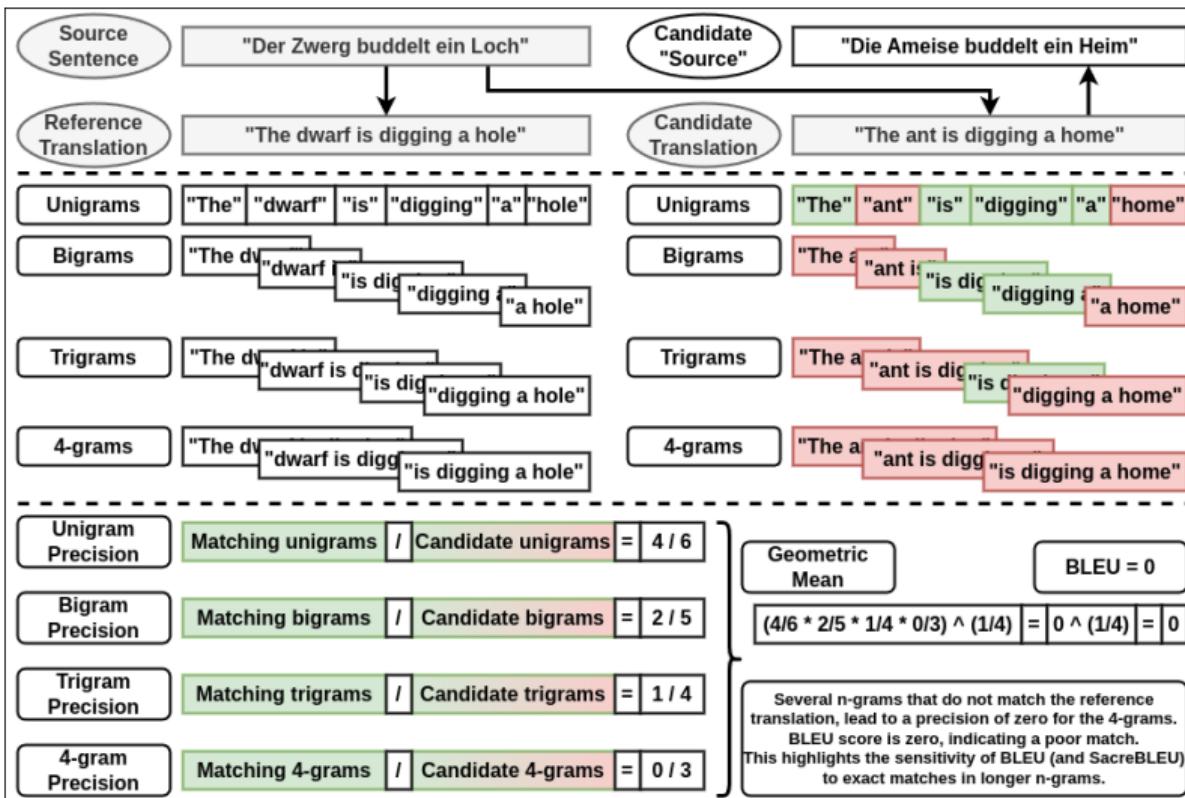
# Language Ambiguity II - Limitation?



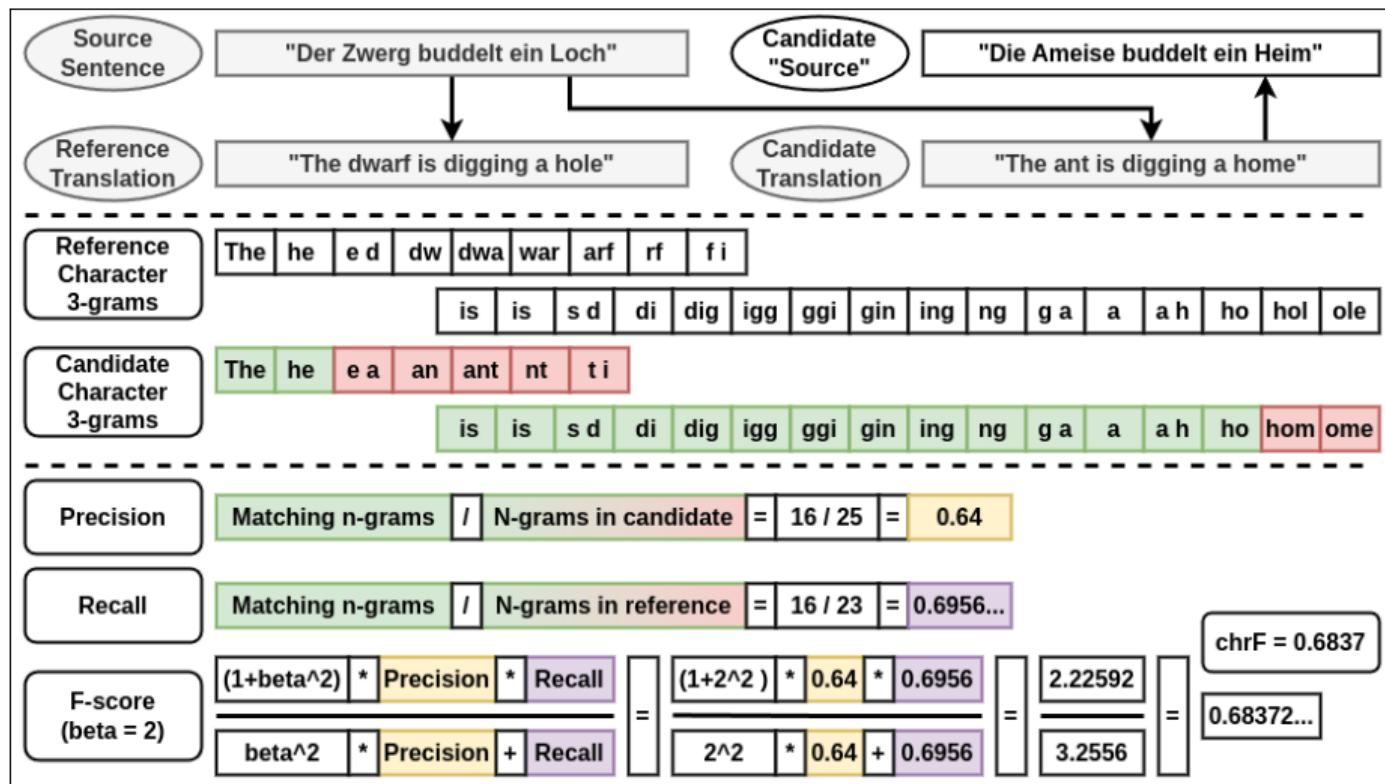
# Language Ambiguity III - Potential?



# MT Evaluation - BLEU



# MT Evaluation - chrF



# MT Evaluation - TER

