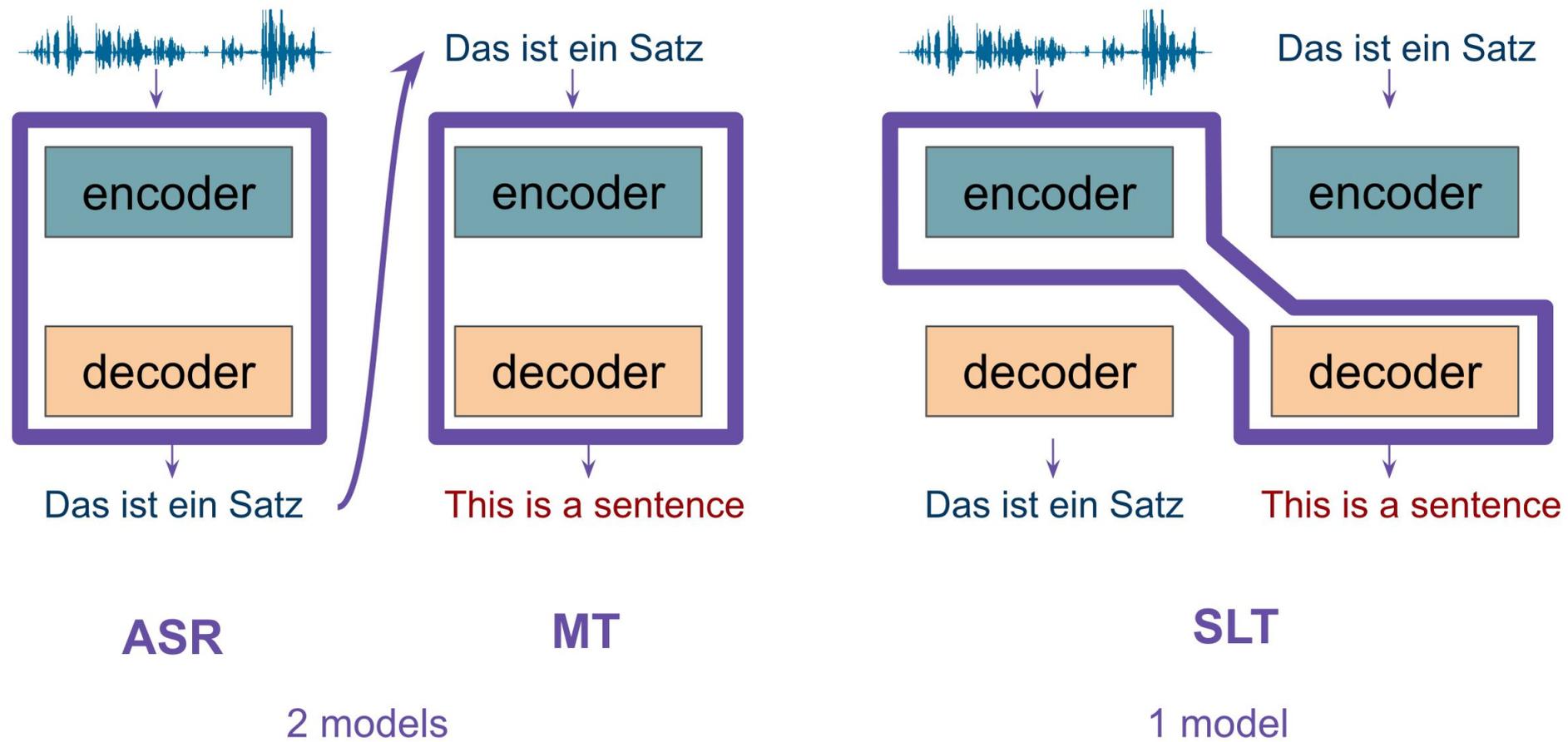


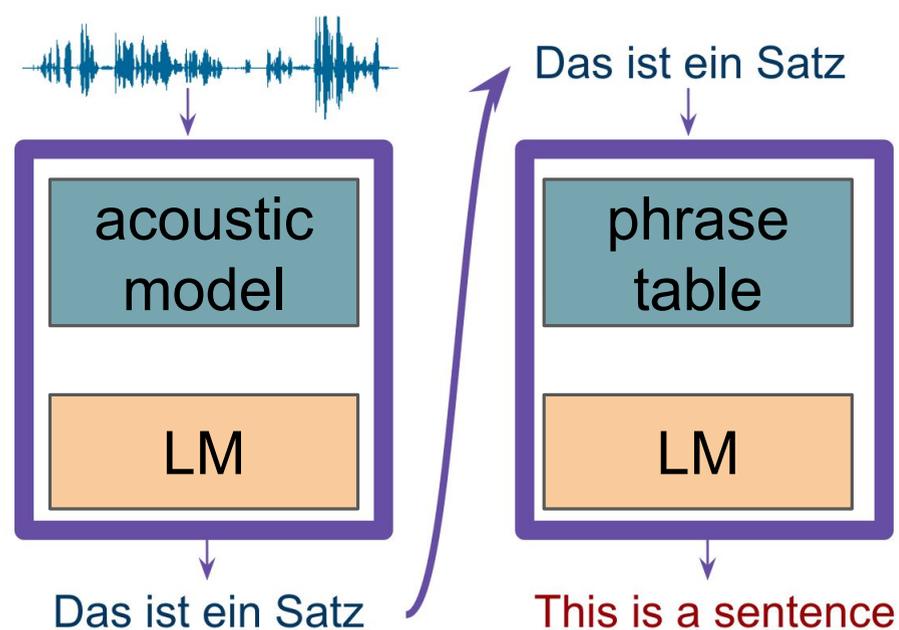
Sec 1.3

Traditional cascade approach

Traditional cascade approach



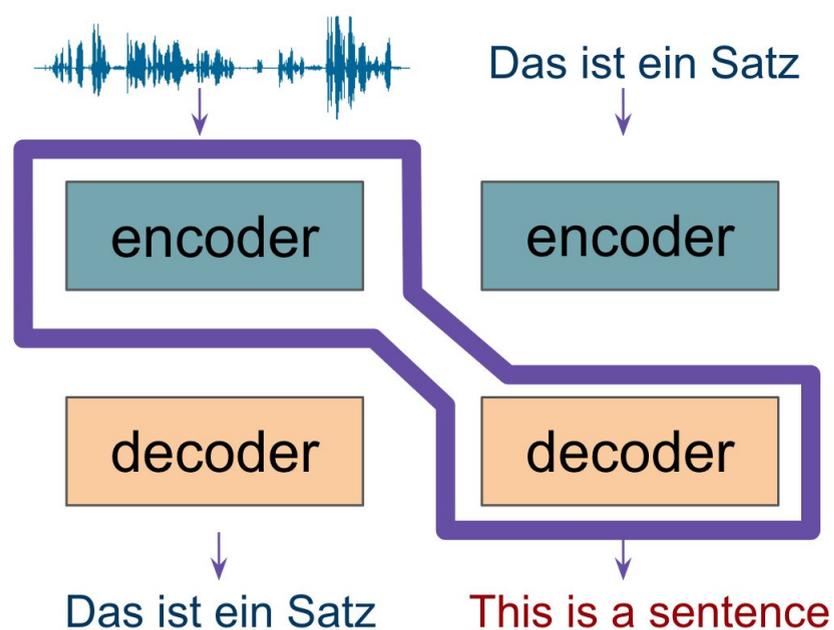
Traditional cascade approach



ASR

MT

2 models



SLT

1 model

Modular, pipeline approach

ASR, MT: isolated objectives

(Waibel et al. 1991; Vidal, 1997; Ney, 1999; Saleem et al. 2004; Matusov et al. 2005; Bertoldi and Federico, 2005; Quan et al. 2005; Kumar et al. 2014; IWSLT Eval Campaigns 2004—)

Data Used

- Datasets with parallel speech + translations arose with E2E models
- Traditionally, cascades used separate datasets for their component models
- **IWSLT Evaluation Campaigns (2004-present):** ASR, MT, ST tasks

⊕ *many more data sources*

⊖ *data is from different domains*

Modular Models

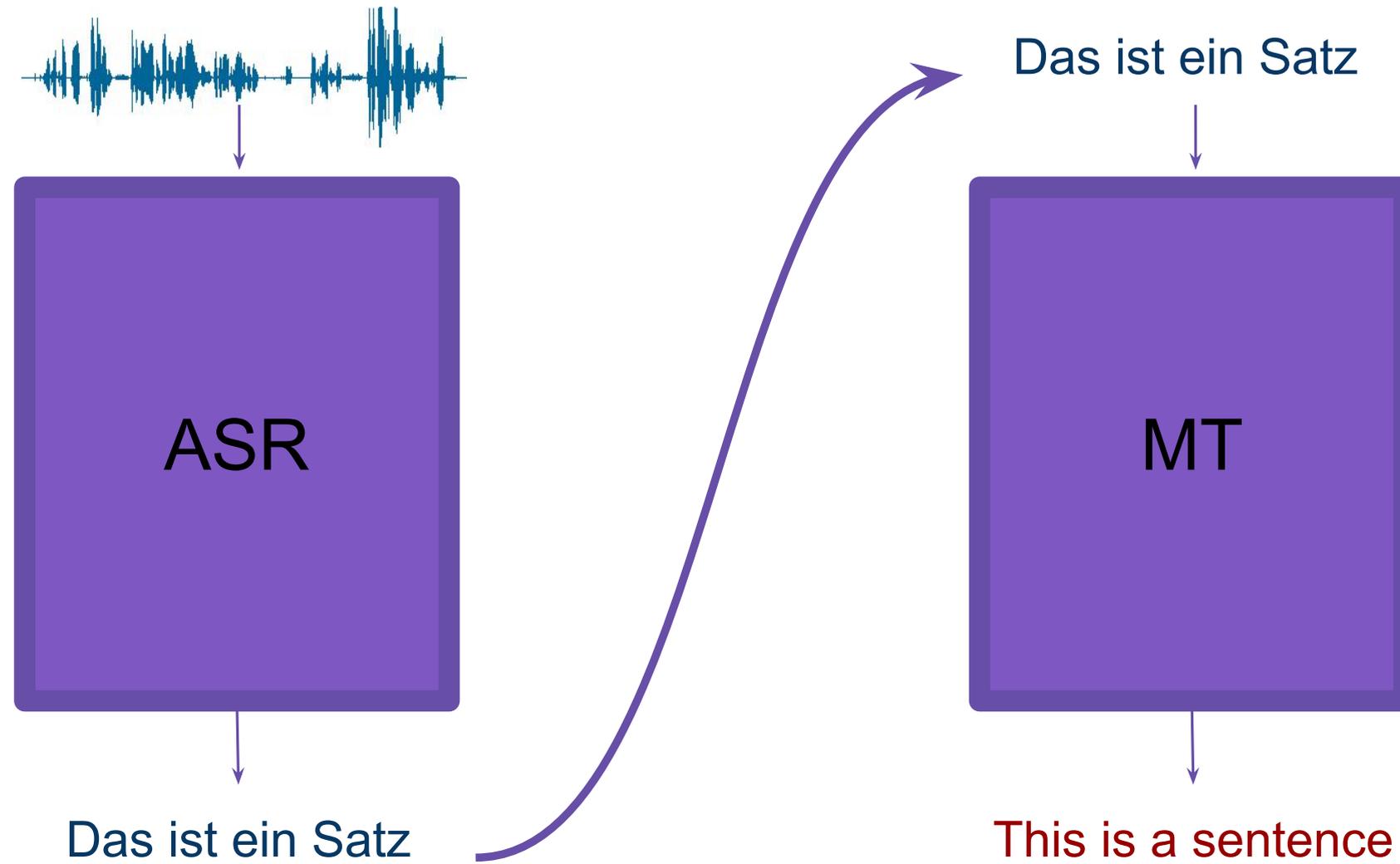
Domain challenge: mismatch between ASR output and MT input

ASR output:

- lowercase, punctuation removed
- disfluencies (um, uh, ..., repetitions, false starts)
- ASR errors

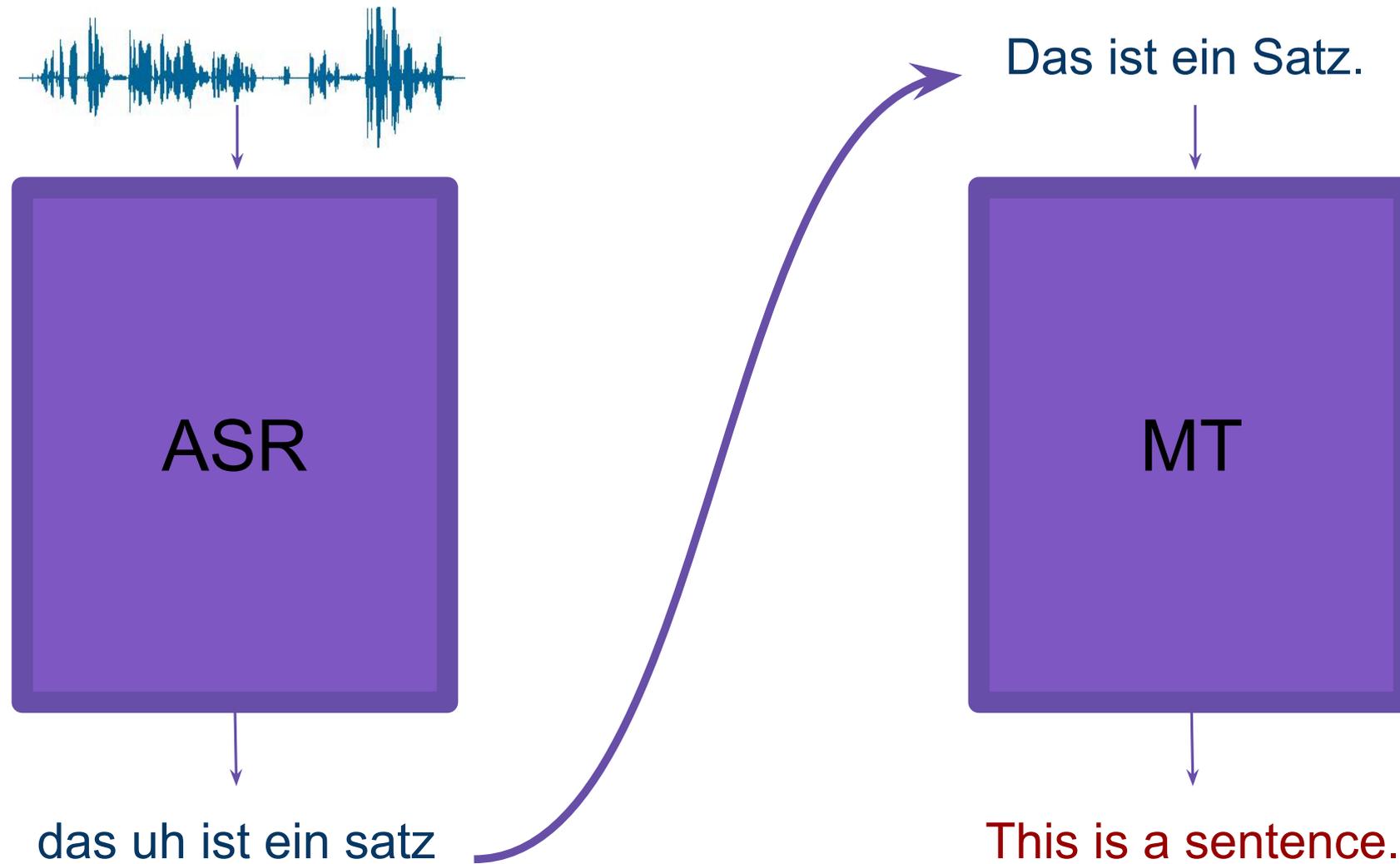
→ *Differing training data domains, train-test mismatch:
requires adaptation!*

Modular Models



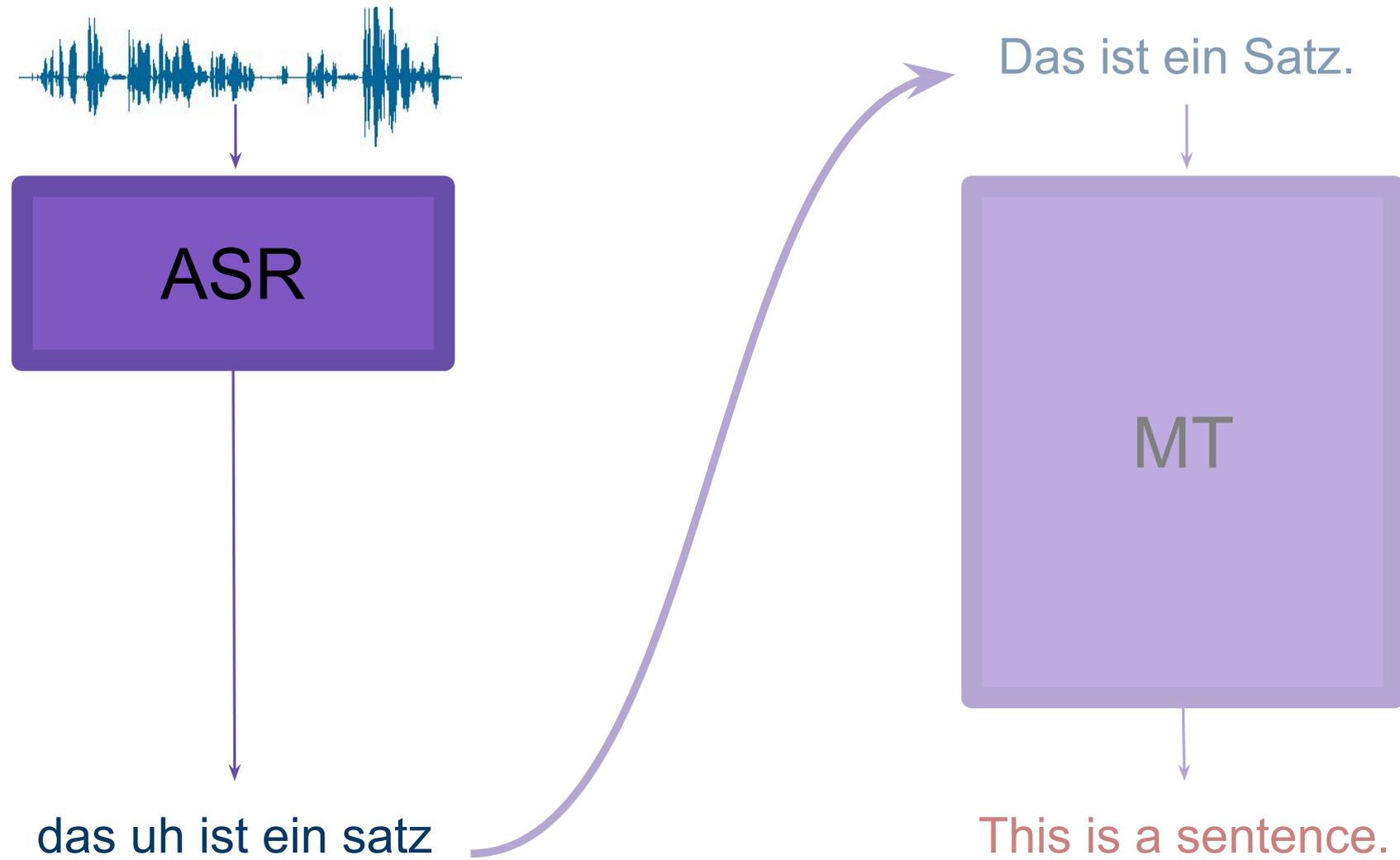
2 models

Modular Models

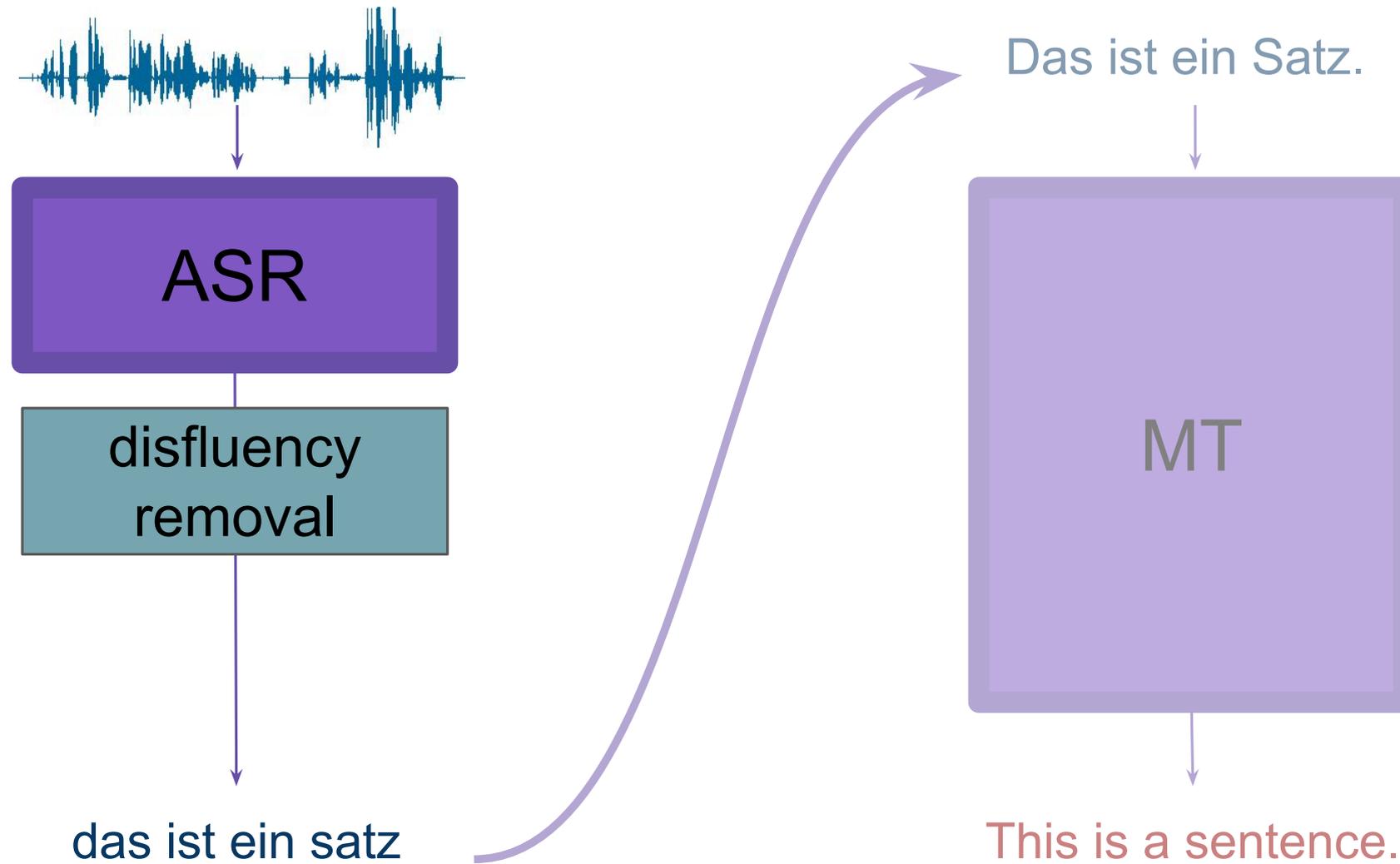


2 models

Modular Models

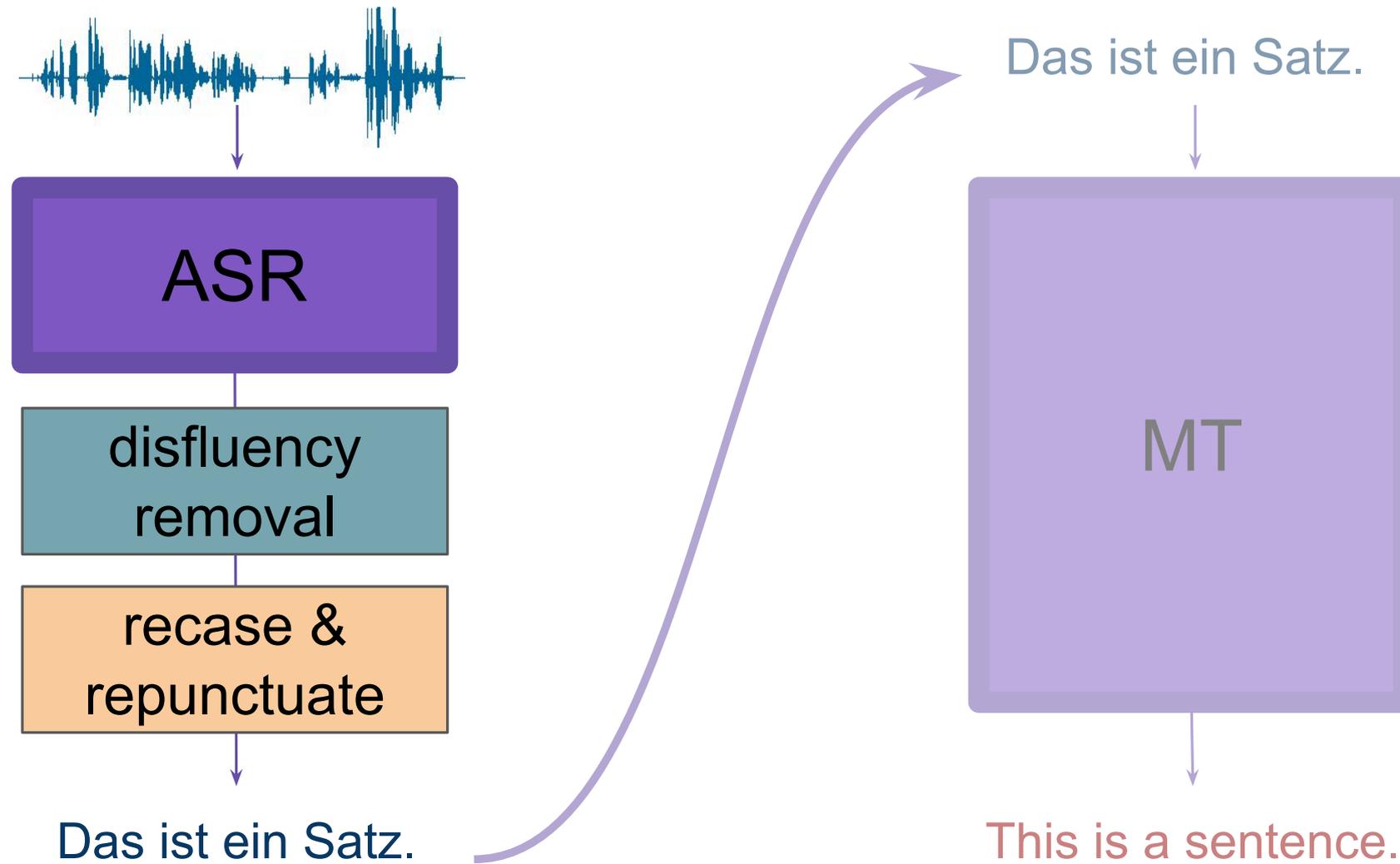


Modular Models



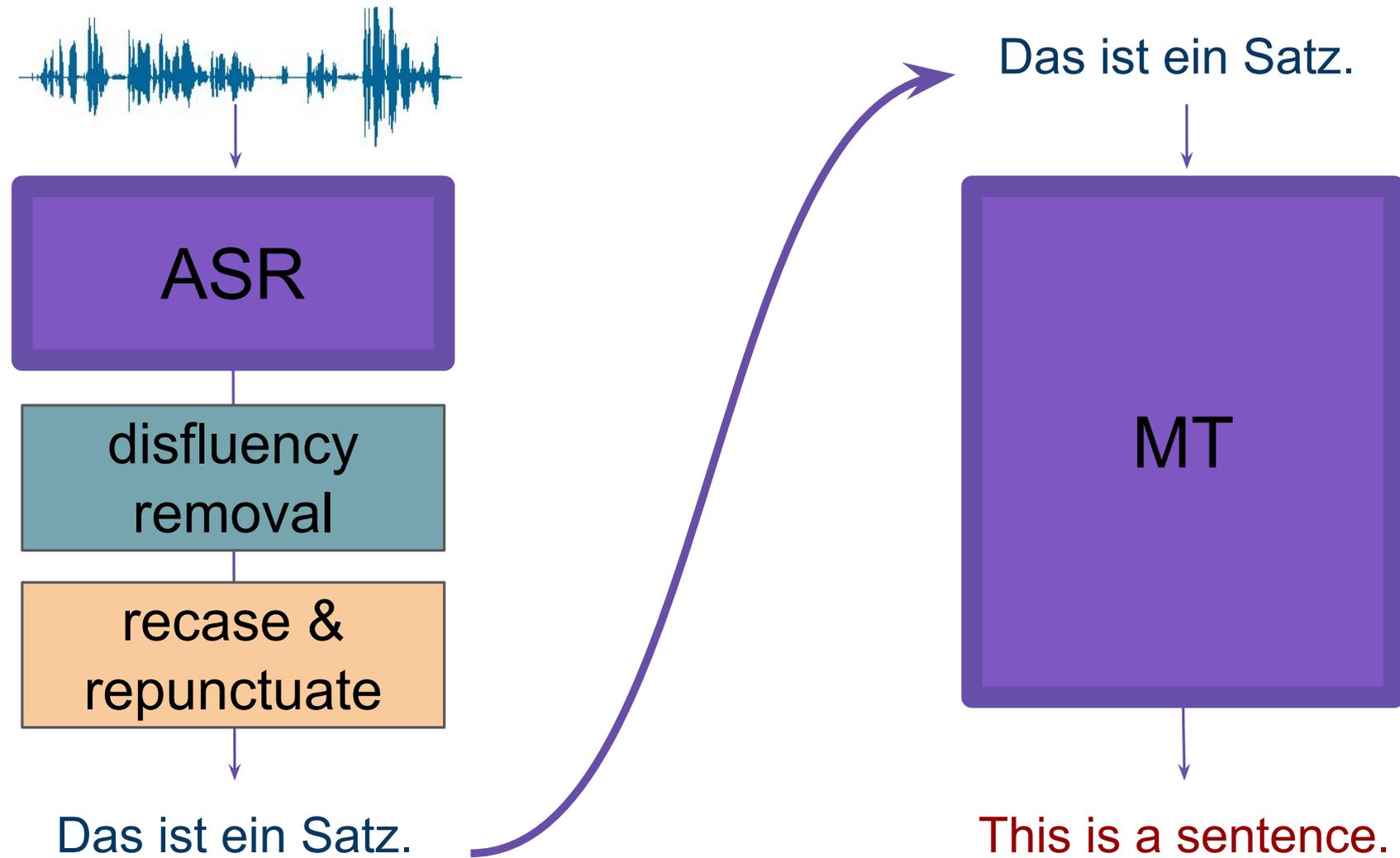
(Wang et al. 2010; Cho et al. 2013/2014)

Modular Models

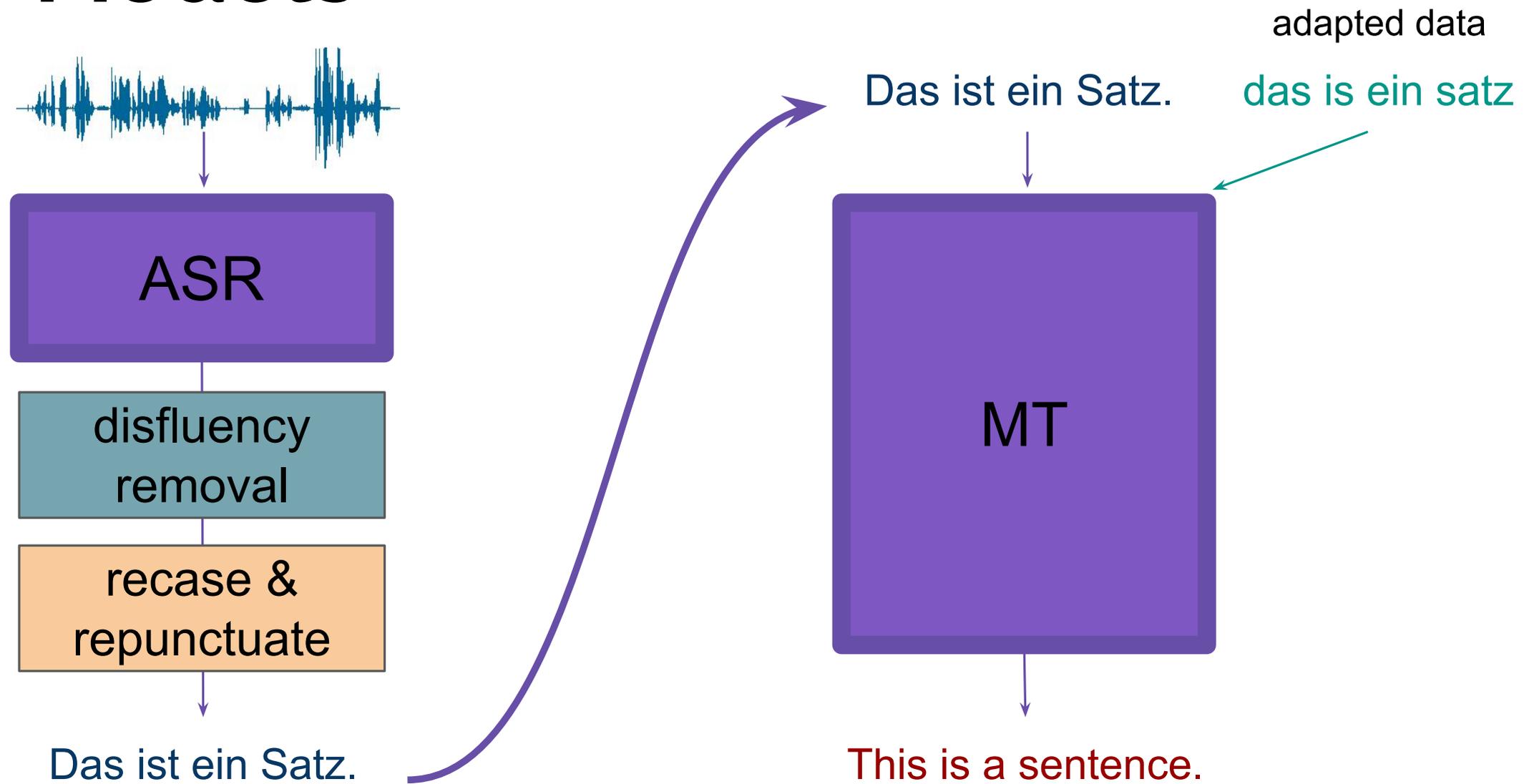


(Cho et al. 2012; Cho et al. 2017)

Modular Models

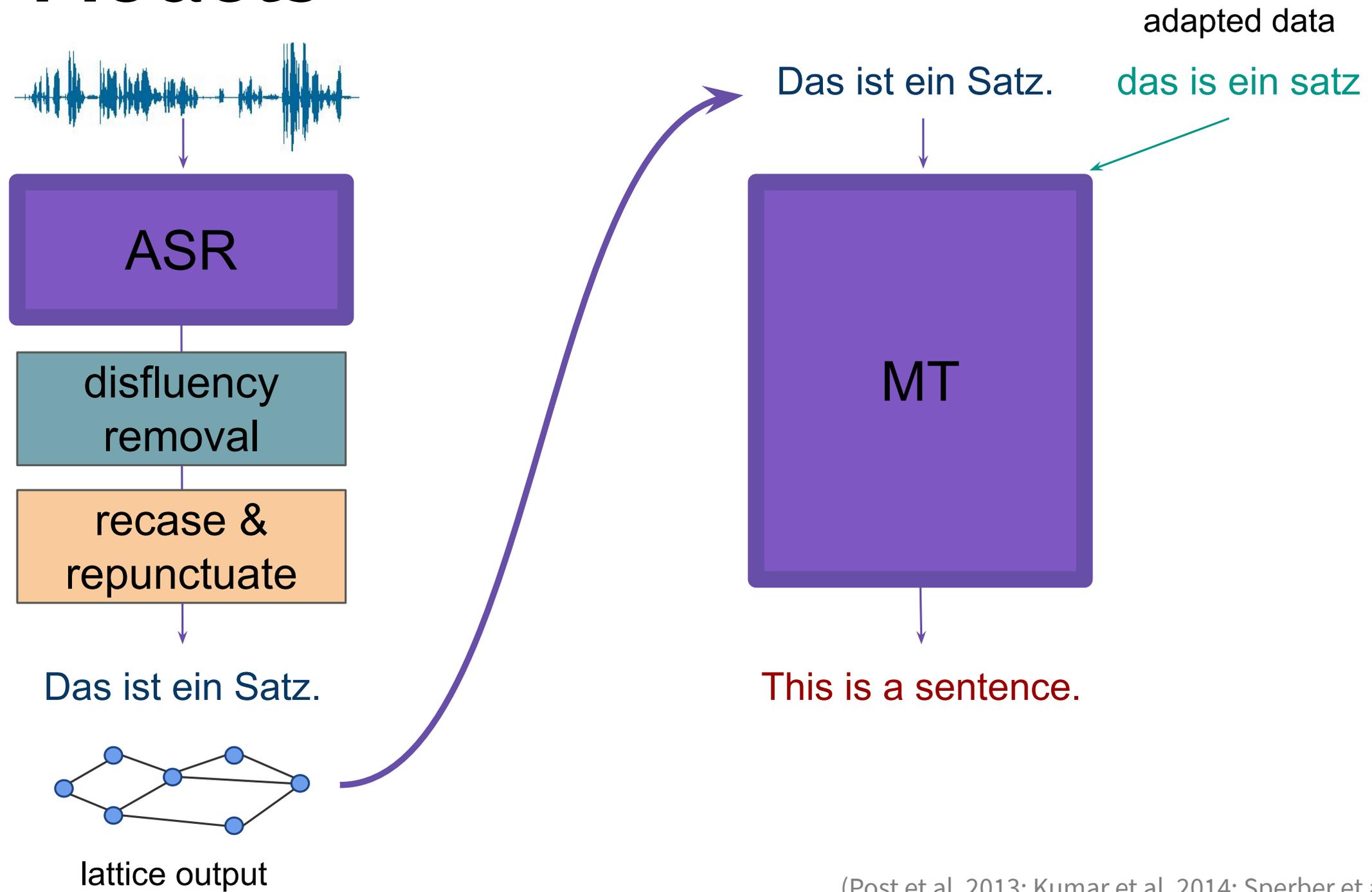


Modular Models



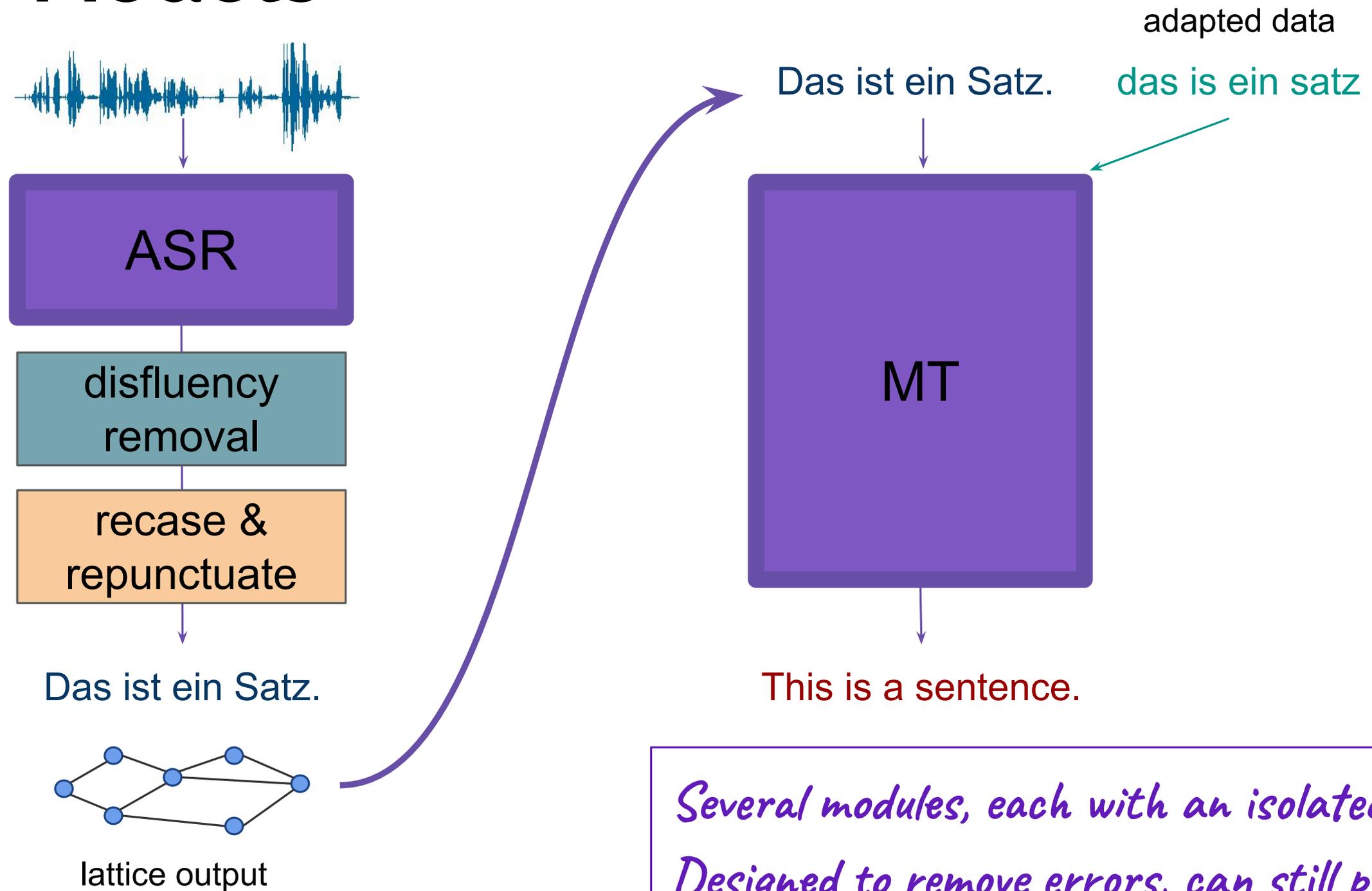
(Tsvetkov et al. 2014; Ruiz et al. 2015;
Sperber et al. 2017)

Modular Models



(Post et al. 2013; Kumar et al. 2014; Sperber et al. 2017)

Modular Models



*Several modules, each with an isolated task
Designed to remove errors, can still propagate*