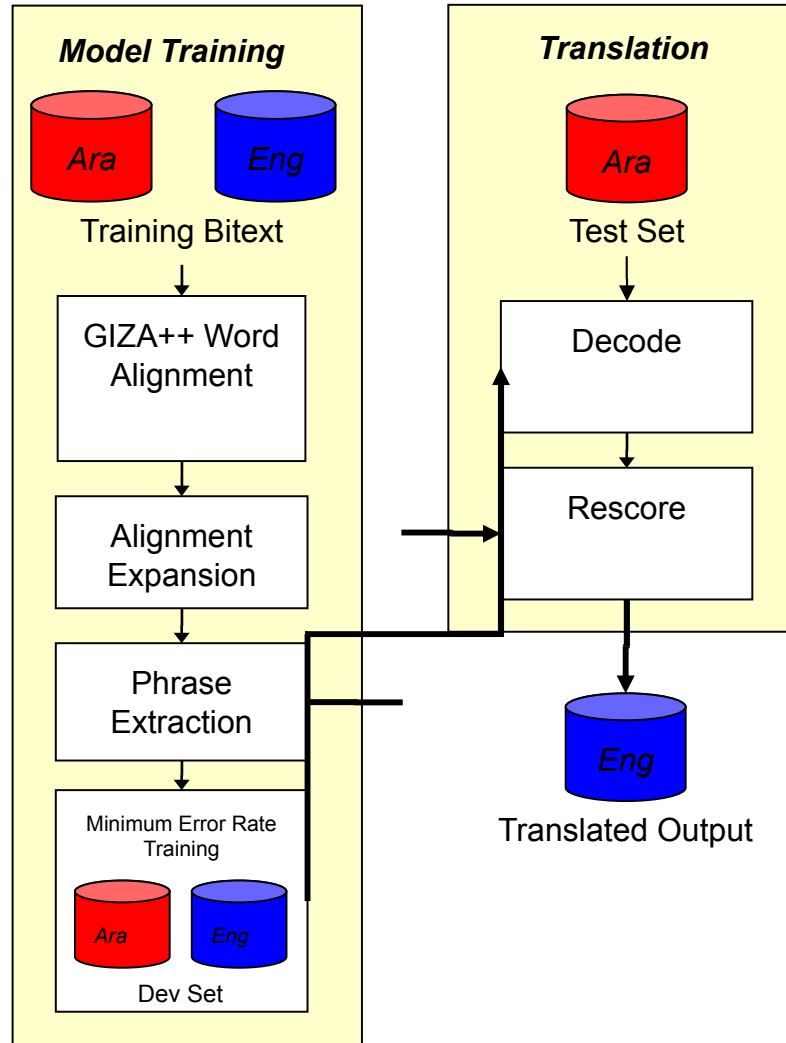


# **IWSLT 2010 BTEC Task**

2 December 2010

# Statistical Translation System



# AP5 Preprocessing

Preprocessing Method	Mean BLEU on dev6
Baseline (No normalization or AP5)	42.06
Remove all diacritics except tanween, no AP5	49.40
Remove all diacritics, no AP5	50.39
Remove all diacritics, apply AP5	53.55

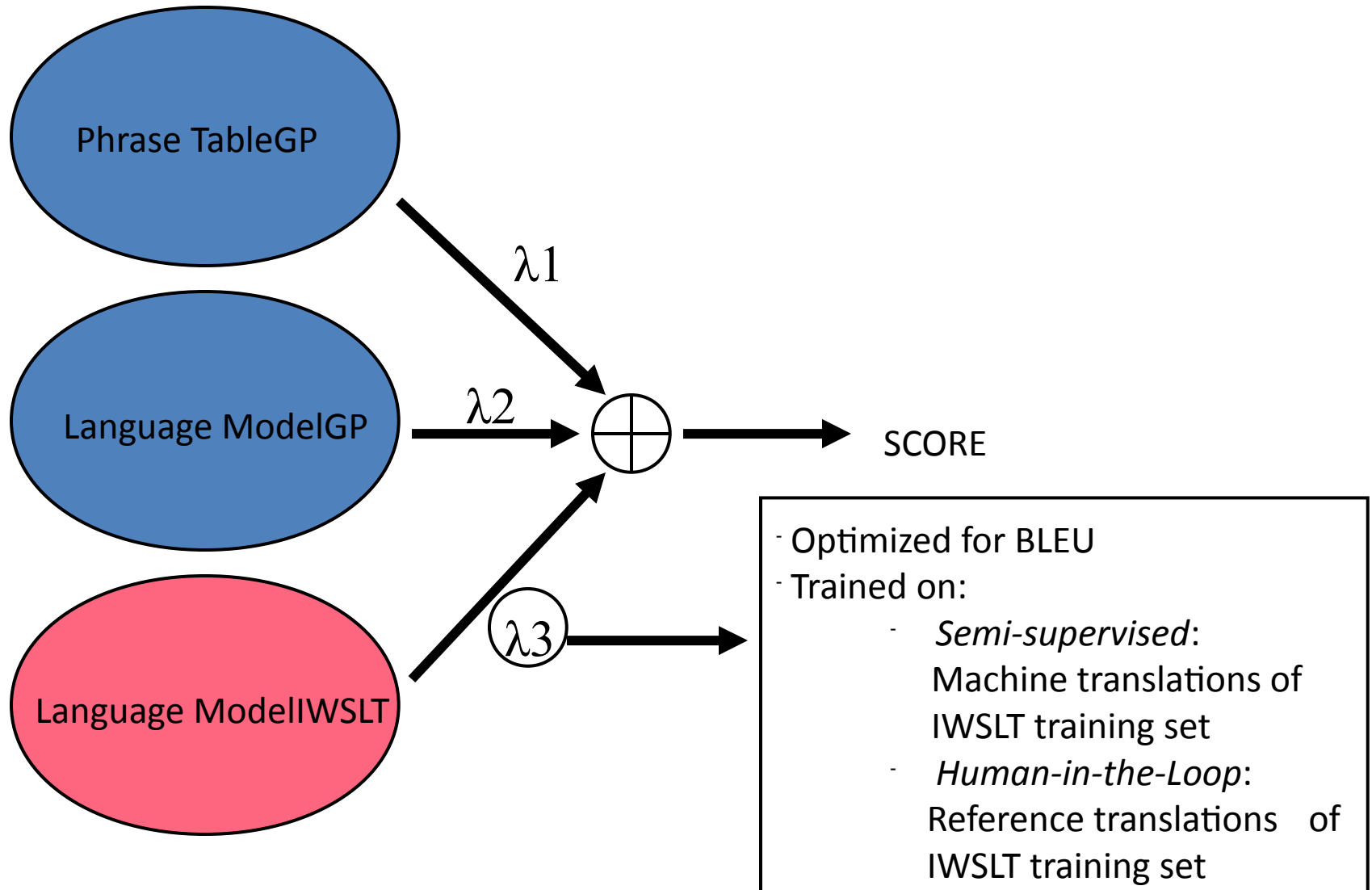
# CoMMA Experiments

CoMMA Threshold	Mean BLEU	
	dev 6	dev 7
0	50.00	51.94
20	53.92	54.29
200	53.14	54.64
2,000	54.02	54.57
10,000	53.33	54.48

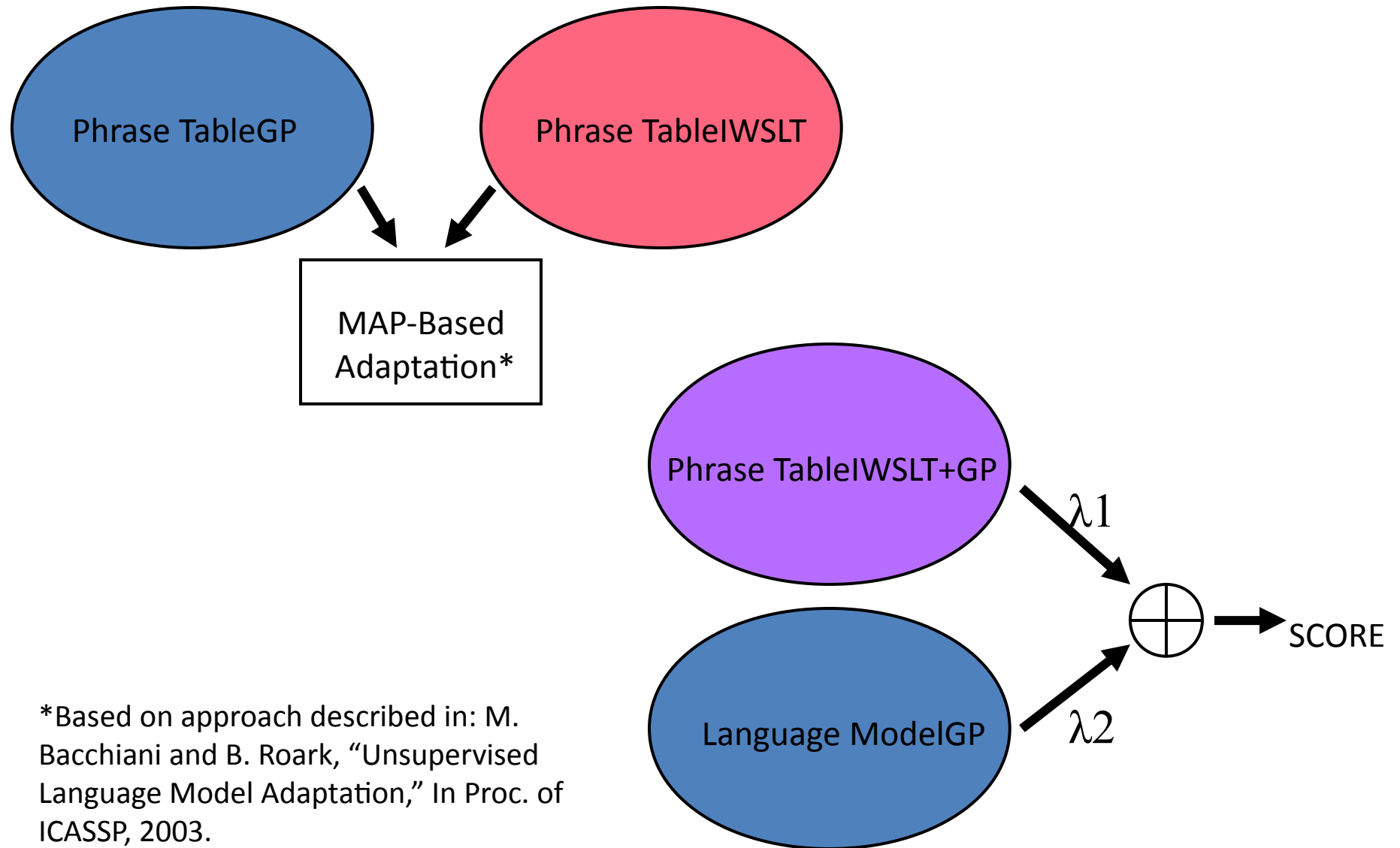
# Lexical Approximation

System	BLEU
Baseline (arabic, with CoMMA+AP5)	55.40
Baseline + LexApprox	56.67

# Language Model Adaptation



# Phrase Table Adaptation



\*Based on approach described in: M. Bacchiani and B. Roark, "Unsupervised Language Model Adaptation," In Proc. of ICASSP, 2003.

# Phrase Table MAP Adaptation

- **Interpolated phrase table probabilities:**

$$\hat{p}(s | t) = \lambda p_{in-domain}(s | t) + (1 - \lambda) p_{gp}(s | t)$$

- **$p_{in-domain}$ : probability estimate from in-domain models**
- **$p_{gp}$ : probability estimate from general purpose models**
- **$\lambda$ : interpolation coefficient computed using the following equation:**

$$\lambda = \frac{N_{in-domain}(s, t)}{N_{in-domain}(s, t) + \tau} \quad \text{or} \quad \lambda = \frac{N_{in-domain}(s, t)}{N_{in-domain}(s, t) + N_{gp}(s, t) + t}$$

- **$\tau$ : Fixed-value MAP relevance factor**
- **$N_{in-domain}(s, t)$ : observed count of phrase pair (s,t)**

<i>System</i>	Arabic (dev7 )	French (dev3 )
IWSLT Model Only (baseline)	55.31	65.51
IWSLT MAP-adapted ([1])	58.85	67.39
IWSLT MAP-adapted (modified)	59.75	68.27



# Phrase Table Integration – Early Combination

System	Chi2Eng	Jap2Eng	Ara2Eng
<b>baseline</b>	<b>35.82</b>	<b>33.82</b>	<b>51.01</b>
<b>+CLA translation lexicon</b>	<b>36.28</b>	<b>35.78</b>	<b>52.84</b>
<b>+CLA alignments</b>	<b>37.59</b>	<b>38.77</b>	<b>54.14</b>
<b>+re-segmented data</b>	<b>38.29</b>	<b>38.97</b>	–
<b>+chunked data</b>	–	<b>39.59</b>	–
<b>+non-monotone search</b>	<b>42.51</b>	<b>44.66</b>	<b>56.40</b>

CoMMA Threshold	Mean BLEU	
	CoMMA	CoMMA-MTT
0	52.20	52.98
20	53.65	55.10
200	54.82	55.57
2,000	<b>55.02</b>	55.36
10,000	54.96	<b>55.86</b>

# System Combination

<i>Arabic-to-English Systems</i>		
<i>System</i>	<i>Features</i>	<b>BLEU</b>
AE-primary 2009	2009 baseline	57.17
AE-primary	2010 combined system	58.69
AE-contrast2	2010 best individual system (baseline)	56.58
<i>Turkish-to-English Systems</i>		
<i>System</i>	<i>Features</i>	<b>BLEU</b>
TE-primary 2009	2009 baseline	60.01
TE-primary	2010 combined system (without CoMMA)	60.21
TE-contrast1	2010 combined system	60.78
TE-contrast4	2010 best individual system (baseline + MIRA)	58.85
<i>French-to-English Systems</i>		
<i>System</i>	<i>Features</i>	<b>BLEU</b>
FE-primary	2010 combined system	63.62
FE-contrast2	2010 best individual system (baseline + MBR)	63.22
<i>TALK Task Systems</i>		
<i>System</i>	<i>Features</i>	<b>BLEU</b>
TALK-primary	2010 combined system	26.50
TALK-contrast3	2010 best individual system (baseline + Gigaword)	26.12

THANK YOU....

QUESTIONS??