



# Merging Alignments

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# Symmetrization

Refined method: ?

$$A = A_{fe} \cap A_{ef}$$

Add  $(i, j) \in A_{fe}$  or  $(i, j) \in A_{ef}$  to  $A$  iteratively as follows:

1. Neither  $f_j$  nor  $e_i$  is aligned; or
2. Both
  - (a)  $(i, j)$  has a vertical or horizontal neighbor already in  $A$  ; and
  - (b) the set  $A \cup \{(i, j)\}$  does not contain alignments with both horizontal and vertical neighbors.

# Alignment merging

```
GROW-DIAG-FINAL(e2f, f2e):
```

```
  neighboring = ((-1,0), (0,-1), (1,0), (0,1), (-1,-1), (-1,1), (1,-1), (1,1))
```

```
  alignment = intersect(e2f, f2e);
```

```
  GROW-DIAG(); FINAL(e2f); FINAL(f2e);
```

```
GROW-DIAG(): iterate until no new points added
```

```
  for english word e = 0 ... en
```

```
  for foreign word f = 0 ... fn
```

```
    if ( e aligned with f )
```

```
      for each neighboring point ( e-new, f-new ):
```

```
        if ( ( e-new not aligned and f-new not aligned ) and
```

```
            ( e-new, f-new ) in union( e2f, f2e ) )
```

```
          add alignment point ( e-new, f-new )
```

```
FINAL(a):
```

```
  for english word e-new = 0 ... en
```

```
  for foreign word f-new = 0 ... fn
```

```
    if ( ( e-new not aligned or f-new not aligned ) and
```

```
        ( e-new, f-new ) in alignment a )
```

```
      add alignment point ( e-new, f-new )
```

# Symmetrization

## Intersection

Size	Precision	Recall	AER
0.5K	97.5	76.8	13.6
2K	97.2	85.6	8.6
8K	97.5	86.6	8.0
34K	98.1	87.6	7.2

## Refined

Size	Precision	Recall	AER
0.5K	87.8	92.9	9.9
2K	91.3	94.2	7.4
8K	92.8	96.0	5.8
34K	94.0	96.9	4.7

## Union

Size	Precision	Recall	AER
0.5K	74.8	96.1	16.9
2K	84.1	96.9	10.6
8K	87.0	97.7	8.5
34K	90.6	98.4	6.0

Your method here!