**System Description**

Input: 「ウィスキーはオオムギから製造される」

Output: whisky is produced from barley

**Model Decomposition**

\[
P(\{e, f\}, a) = P_G(\ell; p_k) \prod_{(e, f)} P_M(\{e, f\}) P(a | \{e, f\})
\]

- **Dependency relations**
  - dependency of phrases
  - dependency relations

**Model Training**

- **Initialization**
  - Create heuristic phrase alignment like ‘grow-diag-final-and’ on dependency trees using results from GIZA++
  - Count phrase alignment and dependency relations

- **Refine the model by Gibbs sampling**
  - Operators: SWAP, TOGGLE, EXPAND

**Translation Samples**

**Japanese -> English**

<table>
<thead>
<tr>
<th>BLEU</th>
<th>Adequacy</th>
<th>Acceptability</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.95</td>
<td>2.62</td>
<td>0.474</td>
</tr>
</tbody>
</table>

**English -> Japanese**

<table>
<thead>
<tr>
<th>BLEU</th>
<th>Adequacy</th>
<th>Acceptability</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.58</td>
<td>2.60</td>
<td>0.47</td>
</tr>
</tbody>
</table>

**Chinese -> English**

<table>
<thead>
<tr>
<th>BLEU</th>
<th>Adequacy</th>
<th>Acceptability</th>
</tr>
</thead>
<tbody>
<tr>
<td>30.72</td>
<td>3.29</td>
<td></td>
</tr>
</tbody>
</table>

**Related Work**

- [DeNero+ 2008]
- [Proposed Nakazawa+ 2011]

**Simple position-based reordering**

**Dependency tree-based reordering**

**Output:**

以上の各センサの出力は、エンジン制御回路（以下「ECU」と表記する）に供給される。

The outputs of the above sensors are supplied to an engine control unit (ECU).

The polarization converter 414 converts the light from the second lens array 413 to a linearly polarized light, thereby enhancing the light utilization efficiency of the optical device 44.

The cooling water in the first water jacket 35a is supplied to the inhibits outlet 35c.

The temperature of the exhaust gas at the exhaust gas outlet 35c is measured using the electrical sensor 44.