The Transfer Module for Japanese
Tsutomu Fujinami
Martin Emele
Christine Nanz

Universität Stuttgart

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1 Introduction

In this report, we explain how the current version of transfer module for Japanese works. To make the discussion as concrete as possible, we confine ourselves to examining the reference dialog that we aimed to cover for the latest demonstration presented at Aachen. In the below, we reproduce the reference dialog just to make it sure that we are working on the same set among various sites:

(1) a. H: hiratsuka desu keredomo
   b. H: konnichiwa
   ( "Hiratsuka speaking. hello." )

(2) a. T: takemoto desu
   b. T: konnichiwa
   ( "Takemoto speaking. hello." )

(3) a. H: sensee
   b. H: o genki desu ka
   ( "How are you?" )

(4) a. T: hai
   b. T: okagesama de genki de yat te ori masu
   ( "Fine, thank you." )

(5) a. H: *migetsu ni yotee shi te ru kokusai kaii gi no uchiwase o shi tain desu keredomo
   b. H: naN nichii ga yoroshii deshoo ka
   ( "I would like to make arrangements as to the international conference scheduled for next month. Which day is fine with you?" )

(6) a. T: chotto mat te kudasai
   b. T: soo desu ne
   c. T: *sore dewa raishu no suiyobi juu shichi deshoo ka
   ( "Just a minute. Let me see. Then, how about Wednesday 11th next week?" )

^This should be ‘ichi’.
(7)  a. H: sensee
b. H: mooshiwake ari mase n
c. H: juu ichi nichhi no hi wa seminaa ga ichi nichhi juu hait te ori
mashi te
d. H: *sono tsugi no shuu no juu ichi² nichhi no kayoobi nanka ikaga
deshoo
   ( "I am sorry. The 11th is spent for a seminar all the day. How
about the Tuesday 17th the week after that?" )

(8)  a. T: juu shichi nichhi no kayoobi desu ne
b. T: soo desu ne
c. T: *ichi ji sugi kara deshi tara nantoka yotee ga toreru N desu ga
d. T: *sochira no go tsugoo wa ikaga deshoo ka
   ( "Tuesday 17th, you mean? Well, I can only manage to find a
time after one o'clock. How about you?" )

(9)  a. H: soo desu ka
b. H: *watashi no hoo wa ichi nichhi ai te iru N desu keredomo
c. H: sensee
d. H: juu ichi³ nichhi de yoroshii desu ka
e. ( "I see. For my part, I have all the day free. Is the 17th fine?" )

(10) a. T: hai
    b. T: kochira wa sore de kekko desu
    c. T: jikan no hoo wa nanji kara ga yoroshii desu ka
       ( "Yes, that is fine for my side. Speaking of time, what time is
suitable for you?" )

(11) a. H: ni ji gurai wa doo deshoo ka
    ( "How about around two o'clock?" )

(12) a. T: hai
    b. T: watashi no hoo wa kekko desu keredomo
       ( "Yes, that is fine with me." )

²This should be 'shichi'.
³This should be 'shichi'.
The English translation added to each sentence was proposed by the authors. They are possibly different from the actual English sentences generated by the system.

Of these sentences, the ones marked with * indicates that they were not treated by the semantic construction module, thus, no input was available to the transfer. In the following, we show what VIT terms are handed over to and to what terms they are transferred by what rules. Each explanation will be followed by comments on the input, output, and rules.

To make it easier to read VIT terms, we employ a graphic representation proposed by one of the authors, which can be found in Appendix (§A). This document is prepared for the meeting on the Japanese part held in DFKI, Saarbruecken, on 10th April, 1996.
2 The translation

2.1 1a

Sentence

(1) a. H: hiratsuka desu keredomo

Input

[named(17,i2,hiratsuka), % Semantics
    support(12,i1,i5),
    equal(15,i2,i3),
    keredomo(14,h1),
    decl(13,h2),
    pron(110,i3)],

13, % Main Label
[], % Sorts
    [pronotype(i3,zero)], % Discourse
[], % Syntax
    [mood(i1,ind),
    tense(i1,pres)],
    [ccom_plug(h2,14),
    ccom_plug(h1,12),
    leq(12,h2),
    leq(12,h1),
    leq(14,h2)],
[], % Prosody
[], % Ambiguities

Output

[decl(13,h2), % Semantics
    pron(110,i3),
    equal(15,i2,i3),
    named(17,i2,hiratsuka),
    support(12,i1,i5)],

13, % Main Label
[], % Sorts
    [pronotype(i3,std_sp)], % Discourse
[], % Syntax
    [mood(i1,ind),
    tense(i1,pres)],
    [ccom_plug(h2,12), % Scope

7
leq(12,h2)],
[],% Prosody
[],% Ambiguities

Applied rules

(16) \[[L4:keredomo(H1),
ccom\_plug(H2,L4),
ccom\_plug(H1,L2),
leq(L2,H1),
leq(L4,H2)]
<->
[ccom\_plug(H2,L2)].

(17) \[[H:pron(I),
prontype(I, zero)]
<->
[H:pron(I),
prontype(I, std\_sp)].

Explanation

- Rule (16): We regard the sentence as “hiratsuka desu.” by neglecting ‘keredomo’. To eliminate the items of information concerning the word, we replace ccom\_plug(H2,L2) for the five VIT terms.

- Rule (17): By default, we regard any zero pronoun as denoting the speaker.

Comment

- Rule (16): We found it difficult to translate ‘keredomo’ into English, thus, decided to disregard it. There is, therefore, no theoretically intrinsic point in the rule. Some may call such a technique hacking. In the following, we mark the rules where some technique applied to with ☞ rather than ▼ to keep everyone’s mind in peace.
2.2 1b

Sentence

(1)  b. H: konnichiwa

Input

\[ \text{greeting(12,konnichiwa)}, \%
\text{Semantics} \\
12, \%
\text{Main Label} \\
[] \%
\text{Sorts} \\
[] \%
\text{Discourse} \\
[] \%
\text{Syntax} \\
[] \%
\text{Tense and Aspect} \\
[] \%
\text{Scope} \\
[] \%
\text{Prosody} \\
[] \%
\text{Ambiguities} \]

Output

\[ \text{greeting(12,hello)}, \%
\text{Semantics} \\
12, \%
\text{Main Label} \\
[] \%
\text{Sorts} \\
[] \%
\text{Discourse} \\
[] \%
\text{Syntax} \\
[] \%
\text{Tense and Aspect} \\
[] \%
\text{Scope} \\
[] \%
\text{Prosody} \\
[] \%
\text{Ambiguities} \]

Applied rules

(18) \[ \text{L: greeting(konnichiwa)} \]
\[ \leftrightarrow \]
\[ \text{L: greeting(hello)}. \]

Explanation  We only replace ‘hello’ for ‘konnichiwa’.
2.3 2a

Sentence

(2)   a. T: takemoto desu

Input

[named(16,i2,takemoto),
support(12,i1,i4),
equal(14,i2,i3),
dcl(13,h1),
pron(19,i3)],
13, % Main Label
[], % Sorts
[prontype(i3,zero)], % Discourse
[], % Syntax
[mood(i1,ind),
tense(i1,pres)],
[ccom_plug(h1,12),
leq(12,h1)],
[], % Prosody
[] % Ambiguities

Output

[dcl(13,h1), % Semantics
pron(19,i3),
equal(14,i2,i3),
named(16,i2,takemoto),
support(12,i1,i4)],
13, % Main Label
[], % Sorts
[prontype(i3,std_sp)], % Discourse
[], % Syntax
[mood(i1,ind),
tense(i1,pres)],
[ccom_plug(h1,12),
leq(12,h1)],
[], % Prosody
[] % Ambiguities
Explanation

- The default rule for zero pronoun (17) replaces prontype(i3, std_sp) for prontype(i3, zero).

2.4 2b

Sentence

(2) b. T: konnichiwa

Explanation See §2.2.
2.5 3a and 3b

Sentence

(3)  a. H: sensee
    b. H: o genki desu ka

Input

```
[titl e(18,i2,sensee), genki(16,i1),
support(11,i2,i4),
equal(14,i1,i3),
ynq(13,i1),
pron(110,i3)],
13,
[],
[honor_inst(i1),
pron_type(i3,zero)],
[],
[mood(i2,ind),
tense(i2,pres)],
[ccom_plug(h1,i1),
leq(11,h1)],
[], % Prosody
[] % Ambiguities
```

Output

```
[fine(16,i1), support(11,i2,i6),
pron(110,i1),
ynq(13,i1),
title(18,i2,mister)],
13,
[], % Sorts
[], % Discourse
[pron_type(i1,std_he),
honor_inst(i1)],
[], % Syntax
[mood(i2,ind),
tense(i2,pres)],
[ccom_plug(h1,i1),
leq(11,h1)],
[], % Prosody
[] % Ambiguities
```
Applied rules

(19) \[ L:\text{title}(I, \text{sensee}) \]
\[ \rightarrow \]
\[ L:\text{title}(I, \text{mister}). \]

(20) \[ L6:\text{genki}(I1) \]
\[ \rightarrow \]
\[ L6:\text{fine}(I1). \]

(21) \[ H:\text{support}(I, L4), \]
\[ L4:\text{equal}(I1, I3), \]
\[ L9:\text{pron}(I3), \]
\[ \text{prontype}(I3, \text{zero})], \]
\[ [L6:\text{genki}(I1)] \]
\[ \rightarrow \]
\[ [H:\text{support}(I, L6), \]
\[ L9:\text{pron}(I1), \]
\[ \text{prontype}(I1, \text{std}_\text{he})]. \]

Explanation

- Rule (19): This replaces ‘mister’ for ‘sensee’.
- Rule (20): This replaces ‘fine’ for ‘genki’.
- Rule (21): This eliminates \text{equal}(I4, i1, i3) to take \text{genki}(I6, i1) as the second argument of \text{support}. The index i3 of \text{equal}(I4, i1, i3) is thrown away, and i1 is regarded instead as the zero pronoun to be interpreted as the hearer.

Comment

- As a translation for ‘sensee’, ‘mister’ sounds odd. We should drop it in the context. Otherwise, more formal expression, “Prof. Takemoto”, is preferable.

- The rule (21) shows some technique. The semantic representation does not appear to be correct. Ideally, the two rules, (19) and (20), should be enough to produce the output.
2.6 4a

Sentence

(4) a. T: hai

Input

\[ \text{[excl(11,hai)]}, \] % Semantics
11, % Main Label
\[ \] % Sorts
\[ \] % Discourse
\[ \] % Syntax
\[ \] % Tense and Aspect
\[ \] % Scope
\[ \] % Prosody
\[ \] % Ambiguities

Output

\[ \text{[excl(11,yes)]}, \] % Semantics
11, % Main Label
\[ \] % Sorts
\[ \] % Discourse
\[ \] % Syntax
\[ \] % Tense and Aspect
\[ \] % Scope
\[ \] % Prosody
\[ \] % Ambiguities

Applied rules

(22) \[ [L1: excl(hai)] \]
\[ \text{<->} \]
\[ [L1: excl(yes)]. \]

Explanation  ‘hai’ is translated to ‘yes’. See §2.24 for the discussion on the word.
2.7 4b

Sentence

(4) b. T: okagesama de genki de yat te ori masu

Input

```
[okagesama(13,i4), % Semantics
genki(11,i2),
yat(14,i1),
dem(17,h1),
de(16,i1,i4),
de(15,i1,i2),
arg2(14,i1,i3),
demonstrative(114,i4,i3),
pron(112,i3),
demonstrative(115,i2,i1)],
```

```
17, % Main Label
[], % Sorts
[honor_inst(i1),
demontype(i4,undef),
pronmtyp(i3,zero),
demontype(i2,undef)],
[] , % Syntax
[mood(i1,ind),
tense(i1,pres)],
[group(12,[14,16,15]),
ccomPlug(h1,i2),
leq(12,h1)],
[] , % Discourse
[] % Tense and Aspect
[] % Scope
[] % Prosody
[] % Ambiguities
```

Output

```
[excl(17,fine), % Semantics
 excl(17,thank_you)],
```

```
17, % Main Label
[], % Sorts
[], % Discourse
[], % Syntax
[], % Tense and Aspect
[], % Scope
[], % Prosody
[] % Ambiguities
```
Applied rules

(23)  
[L1:genki(I2),  
L3:okagesama(I4),  
L4:yat(I1),  
L4:arg2(I1,I3),  
L5:de(I1,I2),  
L6:de(I1,I4),  
L7:decl(H1),  
L12:pron(I3),  
L14:demonstrative(I4,L3),  
L15:demonstrative(I2,L1),  
demontype(I4,undefined),  
prontype(I3,zero),  
demontype(I2,undefined),  
mood(I1,indicative),  
tense(I1,present),  
group(L2,[L4,L6,L5]),  
ccomplug(H1,L2),  
leq(L2,H1),  
honor_inst(I1)]  
<->  
[L7:excl(fine),  
L7:excl(thank_you)].

Explanation

- As you can see, everything is thrown away to generate “Fine, thank you”.

Comment

- First of all, the sentence is too colloquial to translate to English directly. The phrase, “okagesama de”, is especially hard to translate. We may translate it to “thank you”.

- In German, “okagesama” may be translated to “danke für die Nachfrage”.

- The sentence, “genki de yat te ori masu”, may be translated to “I am fine”. In the future, “Thank you, I’m fine.” should be generated compositionally.

- The predicate de of de(16,11,i4) and de(15,i1,i2) should be replaced for with some more semantically meaningful predicate.
• It is unclear why ‘okagesama’ and ‘genki’ should be analysed as demonstrative, i.e., demonstrative(114, i4, l3) and demonstrative(115, i2, l1).

• The information expressed with honor_inst(i1) must be somehow reflected in the generated English sentence, but we could not deal with the honorific information.
2.8 5b

Sentence

(5)  a. H: *raigetsu ni yotee shi te ru kokusaikaigi no uchiawase o shi tai
     n desu kedo

     b. H: NaN nichii ga yoroshii deshoo ka

Input

[whq(19,12,h1),
 yoroshii(13,i1),
 support(11,12,13),
 dofm(12,15,u),
 ga(14,i1,i5),
 demonstrative(115,i5,12)],
19,
[],
[deventype(i5,spec)],
[],
[mood(12,ind),
 tense(i2,pres)],
[ccom_plug(h1,11),
 leq(l1,h1)],
[],
[]
% Semantics
% Main Label
% Sorts
% Discourse
% Syntax
% Tense and Aspect
% Scope
% Prosody
% Ambiguities

Output

[fine(13,i1),
 day(12,i1),
 support(11,i2,13),
 whq(19,12,h1)],
19,
[],
[],
[deventype(i5,spec)],
[],
[mood(12,ind),
 tense(i2,pres)],
[ccom_plug(h1,11),
 leq(l1,h1)],
[],
[]
% Semantics
% Main Label
% Sorts
% Discourse
% Syntax
% Tense and Aspect
% Scope
% Prosody
% Ambiguities
Applied rules

(24) \[ L2:\text{dofm}(I1,u) \]
    \[ \leftrightarrow \]
    \[ L2:\text{day}(I1). \]

(25) \[ L5:\text{yoroshii}(I1) \]
    \[ \leftrightarrow \]
    \[ L5:\text{fine}(I1). \]

(26) \[ L4:\text{ga}(I1,I5), \]
    \[ L2:\text{dofm}(I5,\_), \]
    \[ L1:\text{demonstrative}(I5,L2), \]
    \[ \text{demontype}(I5,\text{spec}), \]
    \[ L3:\text{yoroshii}(I1) \]
    \[ \% \text{Context} \]
    \[ \leftrightarrow \]
    \[ L2:\text{day}(I1). \]

Explanation

- Rule (26) shows some technique. ♫

Comment

- As it has been already pointed by SK group themselves, \text{ga}(I4,i1,i5) causes troubles.
- It is unclear why \text{dofm}(I2,i5,u) must be demonstrative, i.e., \text{demonstrative}(I5,i5,i2).
- We have, therefore, removed all these terms. I believe that SK group too wanted not to generate these terms.
- If they had been not generated, \text{demontype}(i5,\text{spec}) must have been useful, but it is removed at any rate.
2.9 6a

Sentence

(6) a. T: chotto mat te kudasai

Input

[chotto(15,h2), % Semantics
mat(11,i1),
imp(14,h1),
arg1(11,i1,i3),
arg2(11,i1,i2),
pron(18,i3),
pron(17,i2)],
14, % Main Label
[], % Sorts
[prontype(i3,zero), % Discourse
prontype(i2,zero)],
[], % Syntax
[mood(i1,ind), % Tense and Aspect
tense(i1,pres)],
[ccomplug(h2,11),
ccomplug(h1,15),
leq(15,h1),
leq(11,h2),
leq(11,h1)],

Output

[please(15,h2), % Semantics
imp(14,h1),
wait_for(11,i1),
pron(17,i2),
arg2(11,i1,i2)],
14, % Main Label
[], % Sorts
[prontype(i2,std_sp)], % Discourse
[], % Syntax
[mood(i1,ind), % Tense and Aspect
tense(i1,pres)],
[ccomplug(h2,11),
ccomplug(h1,15),
leq(15,h1),
leq(11,h2),
leq(11,h1)],
Applied rule

(27)  [L1:mat(I1),
L1:arg1(I1,I3),
L8:pron(I3),
prontype(I3,zero)]
<->
[L1:wait_for(I1)].

(28)  [L3:chotto(H2)]
<->
[L3:please(H2)].

Explanation

• Not only does the rule (27) replace wait_for(l1,i1) for mat(l1,i1), it also removes the terms concerning its first argument, i.e., arg1(l1,i1,i3), pron(l8,i3), and prontype(i3,zero), so that the addressee becomes to be anonymous.

• The default rule (17) replaces prontype(i2,std_sp) for prontype(i2,zero).

Comment

• The original form of (27) was added a constraint _:imp(H1) so that the first argument should be removed only when the sentence mood is imperative. However, due to a bug in the vitADT that imp is not regarded as belonging to semantics, the rule did not work.

• In the input, ‘chotto’ is analysed as a modifier of the event labelled with l1. We thus translate it to ‘please’ by the rule (28). The translation is not correct, but is adopted to represent the meaning of ‘kudasai’, which is missing in the input VIT.

• In another reading, the sentence may be translated to “Wait for me for a while” or “Wait a moment”, where ‘chotto’ specifies the time span of waiting. To represent such a reading, however, some other predicate such as temp_span should have been used, e.g., temp_span(l9,i1,i4) and chotto(l5,i4).
2.10 6b

Sentence

(6)   b.  T: soo desu ne

Input

```
[support(11,i1,l2),
 ne(l4,h1),
dsc1(l3,h2),
sso(l2,i5,i4),
pron(110,i5)],
13,   % Main Label
[],   % Sorts
[prontype(i5,zero)],   % Discourse
[],   % Syntax
[mood(i1,ind),
tense(i1,pres)],
[ccom_plug(h2,14),
 ccom_plug(h1,l1),
  leq(11,h2),
  leq(11,h1),
  leq(14,h2)],
[],   % Prosody
[]    % Ambiguities
```

Output

```
[excl(13,well)],   % Semantics
13,   % Main Label
[],   % Sorts
[],   % Discourse
[],   % Syntax
[],   % Tense and Aspect
[],   % Scope
[],   % Prosody
[]    % Ambiguities
```
Applied rules

(29) \[ \begin{align*}
&\text{L1:support}(I1,L2), \\
&\text{L2:soo}(I3,I4), \\
&\text{L7:pron}(I3), \\
&\text{L4:ne}(H2), \\
&\text{L6:decl}(H4), \\
&\text{prontype}(I3,\text{zero}), \\
&\text{leq}(L1,H2), \\
&\text{leq}(L1,H4), \\
&\text{leq}(L4,H4), \\
&\text{ccom\_plug}(H2,L1), \\
&\text{ccom\_plug}(H4,L4), \\
&\text{mood}(I1,\text{ind}), \\
&\text{tense}(I1,\text{pres})
\end{align*} \] \[\implies [\text{L6:excl}(\text{well})].\]

**Explanation**  Everything is thrown away to generate "well".

**Comment**

- The expression is too colloquial.
- As for \text{decl}(I3,H2), it is not so convincing to classify the sentence as declarative. Sentences ending with ‘ne’ need more investigation.
- The categories currently adopted to analyse sentence moods are all derived from syntactic notions, e.g., imperative, wh-question, and declarative. We should look for more semantical notions.
- It is unclear for what \text{prontype}(I5,\text{zero}) is needed.
2.11  7b

Sentence

(7)    a.  (H: sensee)
       b.  H: mooshiwake ari mase n

Input

[mooshiwake(l3,i4),
  ari(l2,i2),
  neg(l1,i1,h1),
  decl(l5,h2),
  arg3(l2,i2,i3),
  demonstrative(l12,i4,i3),
  pron(l10,i3),
  15, % Main Label
[], % Sorts
[honor_inst(i2), % Discourse
demontype(i4,undef),
  promtype(i3,zero)],
[], % Syntax
[mood(i2,ind), % Tense and Aspect
tense(i2,pres)],
[ccom_plug(h2,l2), % Scope
  ccom_plug(h1,l1),
  leq(l2,h2),
  leq(l2,h1),
  leq(l1,h2)],
[], % Prosody
[] % Ambiguities

Output

[excl(15,sorry), % Semantics
  15, % Main Label
[], % Sorts
[], % Discourse
[], % Syntax
[], % Tense and Aspect
[], % Scope
[], % Prosody
[] % Ambiguities
Applied rules

(30) \[ [L3:mooshiwake(I4), L2:ari(I2), L1:neg(I1,H1), L5:decl(H2), L2:arg3(I2,I3), L12:demonstrative(I4,L3), L10:pron(I3), demotype(I4,undef), prontype(I3,zero), mood(I2,ind), tense(I2,pres), ccomplug(H2,L2), 1eq(L2,H2), honor_inst(I2)] \leftrightarrow [L5:excl(sorry)].

Explanation  Everything is thrown away to generate “Sorry”.

Comment

- No other terms refer to the label l1 of neg(i1,i1,h1). The term is, therefore, meaningless, so are other two terms, l1eq(l2,h1) and l1eq(l1,h2).
- The structure formed by mooshiwake(i2,i3) and demonstrative(i10,i3,i12) is separated from others, thus meaningless.
- We did not deal with honor_inst(i1).
2.12 7c

Sentence

(7) c. H: juu ichi nichii no hi wa seminaa ga ichi nichii juu hait te ori mashi te

Input

[hi(116,15),
 seminaa(12,14),
 nichii(114,13),
 card(113,i3,1),
 hait(16,i2),
 decl(112,h1),
 dofm(15,i6,11),
 no(110,i5,i6),
 wa(19,i2,i5),
 ga(18,i1,i4),
 juu(17,i3,h2),
 arg3(16,i2,i1),
 demonstrative(122,i6,15),
 demonstrative(123,i5,14),
 demonstrative(124,i4,12),
 demonstrative(125,i3,11)],
 l12, % Main Label
 [], % Sorts
 [honor_inst(i2),
 demontype(i6,spec),
 demontype(i5,undef),
 demontype(i4,undef),
 demontype(i3,undef)],
 [], % Syntax
 [mood(i2,ind),
 tense(i2,pres)],
 [group(13,[16,19]),
 group(14,[110,116]),
 group(11,[113,114]),
 ccom_plug(h2,11),
 ccom_plug(h1,13),
 leq(11,h2),
 leq(13,h1),
 leq(17,h1)],
 [], % Tense and Aspect
 [], % Scope
 [], % Prosody
 [] % Ambiguities
Output

[decl(112,h1),
 there_cop(16,i2),
 day(114,i3),
 seminar(12,i4),
 arg3(16,i2,i4),
 card(113,i3,1),
 def(122,i6,15),
 udef(124,i4,12),
 udef(125,i3,11),
 dofm(15,i6,11),
 temp_span(17,i2,i3),
 temp_loc(19,i2,i6)],

112, % Main Label
 [], % Sorts
 [honor_inst(i2)], % Discourse
 [], % Syntax
 [mood(i2,ind),
 tense(i2,pres)], % Tense and Aspect
 [group(13,[16,19]),
 group(11,[113,114]),
 ccom_plug(h1,13),
 leq(11,h2),
 leq(13,h1),
 leq(17,h1)],
 [], % Prosody
 [] % Ambiguities
Applied rules

(31)  [L3:seminaa(I2)]  
     <-
     [L3:seminar(I2)].

(32)  [L1:hait(I1)]  
     <-
     [L1:there_cop(I1)].

(33)  [L68:juu(I9,H2),  
       ccom_plug(H2,L1)],  
     [L6:hait(I2)]  
     <-
     [L68:temp_span(I2,I9)].

(34)  [L66:nichi(I9)]  
     <-
     [L66:day(I9)].

(35)  [L6:arg3(I2,I1),  
       L8:ga(I1,I4)],  
     [L6:hait(I2)]  
     <-
     [L6:arg3(I2,I4)].

(36)  [L9:wa(I2,I5)],  
     [demontype(I5,udef),  
      L10:no(I5,I6)]  
     <-
     [L9:temp_loc(I2,I6)].

(37)  [L16:hi(I5),  
       demontype(I5,udef),  
      L10:no(I5,I6),  
      L23:demontative(I5,L4),  
      group(I4,[L10,L16])]  
     <-
     [].

(38)  [H:demontative(I,L1),  
       demontype(I,spec)]  
     <-
     [H:def(I,L1)].

(39)  [H:demontative(I,L1),  
       demontype(I,udef)]  
     <-
     [H:udef(I,L1)].
Explanation

- In the rule (33), the constraint L6:hait(I2) is added to refer to i2, which is used to generate temp_span(17, i2, i3). This is because the terms for “ichinichi juu” have no connection with the other terms. Good technique, really. But, alas, I forgot to remove leq(11, h2), too!

- The rule (35) removes ga(18, i1, i4). Since this is some technique, the rule is restricted to work only in the context of L6:hait(I2). This also replaces i4 for i1 in arg3(16, i2, i1) to transform it to arg3(16, i2, i4).

- The rule (36) disambiguates wa(19, i2, i5) to temp_loc(19, i2, i6) in the context. The rule hardly makes sense.

- The rule (37) removes the terms for “no hi” of “juu ichi nichio no hi”. This means that we simplify the phrase to “juu ichi nichio”.

- The last two rules, (38) and (39), are default rules handling the definite and non-definite distinction.

Comment

- The terms for “ichinichi juu” are separated from others, thus meaningless.

- The meaning of ‘wa’ is not analysed and treated syntactically, so are ‘ga’ and ‘no’.
2.13 8a and 8b

Sentence

(8)  

a.  T: juu shichi nichei no kayoobi desu ne

b.  T: soo desu ne

Input

```
[support(13,i1,19),  % Semantics
equal(19,i2,i4),
ne(18,h1),
decl(17,h2),
dofm(12,i3,17),
no(i5,i2,i3),
dofw(i4,i2,tue),
pron(i14,i4),
demonstrative(i15,i3,12),
demonstrative(i16,i2,11)],
17,  % Main Label
[],  % Sorts
[prontype(i4,zero),  % Discourse
demontype(i3,spec),
demontype(i2,spec)],
[],  % Syntax
[mood(i1,ind),  % Tense and Aspect
tense(i1,pres)],
[ccom_plug(h2,18),  % Scope
ccom_plug(h1,13),
group(11,[15,14]),
leq(13,h2),
leq(13,h1),
leq(18,h2)],
[],  % Prosody
[]  % Ambiguities
```
Output

```
[decl(17,h2),  % Semantics
  qtag(18,h1),
  pron(114,i4),
  def(115,i3,12),
  def(116,i2,11),
  dof(12,i3,17),
  dof(14,i2,tue),
  equal(19,i2,i4),
  temp_loc(15,i2,i3),
  support(13,i1,i9)],
17,  % Main Label
[],  % Sorts
[prontyp(event)],  % Discourse
[],  % Syntax
[mood(i1,ind),
  tense(i1,pres)],
[ccom_plugin(h2,18),  % Scope
  ccom_plugin(h1,13),
  group(11,[15,14]),
  leq(13,h2),
  leq(13,h1),
  leq(18,h2)],
[],  % Prosody
[]  % Ambiguities
```

Applied rules

(40)  [L2:ne(H2)]
     <->
     [L2:qtag(H2)].

(41)  [L14:prontyp(I4),
      prontyp(I4,zero)],
     [L9:equal(I2,I4),
      L4:dofw(I2,_)]  % Context
     <->
     [L14:prontyp(I4),
      prontyp(I4,event)].

(42)  [L8:no(I3,I4)]
     <->
     [L8:temp_loc(I3,I4)].

31
Explanation

- The rule (40) translates the sentence ending with ‘ne’ to an English sentence with a tag question, e.g., “It is on Tuesday 17th, isn’t it?”
- The rule (41) turns the zero pronoun i4 into an event marker.
- The rule (42) interprets ‘no’ as temp_loc.
- See §2.10 for (8)b.

Comment

- Simply replacing qtag for ne is problematic. It is also a syntactic notion, not semantic.
- The rule (41) seems to be adhoc.
- The rule (42) must be restricted with proper constraints.
2.14 9a

Sentence

(9) a. H: soo desu ka

Input

```
[support(11,1i,12),
yrq(14,h1),
soo(12,15,i4),
pron(110,15)],
14, % Main Label
[], % Sorts
[promtype(15,zero)], % Discourse
[], % Syntax
[mood(i1,ind),
tense(ii,pres)], % Tense and Aspect
[ccom_plug(h1,i1),
leq(11,h1)],
[], % Prosody
[] % Ambiguities
```

Output

```
[excl(14,okay)], % Semantics
14, % Main Label
[], % Sorts
[], % Discourse
[], % Syntax
[], % Tense and Aspect
[], % Scope
[], % Prosody
[] % Ambiguities
```
Applied rules

(L4:excl(okay)).

Explanation  Everything is thrown away to generate “Okay”.

Comment

- This does not seem to be a yes-no question.
- It seems that there are several different uses for ‘ka’, one of which is to construct a question, but this ‘ka’ is uttered to show his recognition. They must be classified differently when prosodic information becomes available.
- It is unclear what soo(12,15,14) means.
2.15 9d

Sentence

(9) c. (H: sensee)
    d. H: jun ichi\(^4\) nichi de yoroshii desu ka

Input

\[
\begin{align*}
\text{[yoroshii}(13,i4), & \quad \text{Semantics} \\
\text{support}(18,i1,i3), & \quad \text{Semantics} \\
\text{ynq}(17,h1), & \quad \text{Semantics} \\
\text{dofm}(12,i5,i11), & \quad \text{Semantics} \\
\text{de}(14,i1,i5), & \quad \text{Semantics} \\
\text{demonstrative}(114,i5,12), & \quad \text{Semantics} \\
\text{pron}(112,i4)], & \quad \text{Main Label} \\
\text{[]}, & \quad \text{Sorts} \\
\text{[demonstrate}(i5,\text{spec}), & \quad \text{Discourse} \\
\text{pronotype}(i4,\text{zero})], & \quad \text{Discourse} \\
\text{[]}, & \quad \text{Syntax} \\
\text{[mood}(i1,\text{ind}), & \quad \text{Tense and Aspect} \\
\text{tense}(i1,\text{pres})], & \quad \text{Tense and Aspect} \\
\text{[group}(11,\text{[18,14]}), & \quad \text{Scope} \\
\text{complug}(h1,i11), & \quad \text{Scope} \\
\text{leq}(11,h1)], & \quad \text{Scope}
\end{align*}
\]

Output

\[
\begin{align*}
\text{[fine}(13,i4), & \quad \text{Semantics} \\
\text{pron}(112,i4), & \quad \text{Semantics} \\
\text{ynq}(17,h1), & \quad \text{Semantics} \\
\text{temp_loc}(14,i1,i5), & \quad \text{Semantics} \\
\text{def}(114,i5,12), & \quad \text{Semantics} \\
\text{dofm}(12,i5,i11), & \quad \text{Semantics} \\
\text{support}(18,i1,i3)], & \quad \text{Main Label} \\
\text{[]}, & \quad \text{Sorts} \\
\text{[pronotype}(i4,\text{std})], & \quad \text{Discourse} \\
\text{[]}, & \quad \text{Discourse} \\
\text{[mood}(i1,\text{ind}), & \quad \text{Tense and Aspect} \\
\text{tense}(i1,\text{pres})], & \quad \text{Tense and Aspect} \\
\text{[group}(11,\text{[18]}), & \quad \text{Scope} \\
\text{complug}(h1,i11), & \quad \text{Scope} \\
\text{leq}(11,h1)], & \quad \text{Scope}
\end{align*}
\]

\(^4\text{This should be 'shichi'.}\)
Applied rule

(44)  [prontype(I4,zero),
    L3:yoroshii(I4),
    L12:pron(I4)]
<->
[L3:fine(I4),
    prontype(I4, std),
    L12:pron(I4)].

(45)  [L4:de(I1,I5),
    group(L1,[L8,I4])],
    [_:dofm(I5,_)]]    % Context
<->
[L4:temp_loc(I1,I5),
    group(L1,[L8])].

Explanation

- The rule (44) translates ‘yoroshii’ to ‘fine’, while it also turns the zero pronoun i4 into std marker.
- The rule (45) shows some technique to handle de. It replaces temp_loc(I1,11,i5) for de(I4,i1,i5) and removes the second element from group(I1,[I8,14]) so that it becomes to be external relative to support(I8,i1,13).

Comment

- The rule (44) is rather adhoc, but it is unclear how i4 should be typed.
- We could further replace l1 for l8, removing group(i1,[i8]), too.
2.16 10b

Sentence

(10) b. T: kochira wa sore de kekko desu

Input

```
[kekko(12,i4),  % Semantics
  support(16,i1,i2),
  decl(15,h1),
  wa(14,i1,i6),
  de(13,i1,i5),
  pron(112,i6),
  pron(111,i5),
  pron(110,i4)],
15,  % Main Label
[],  % Sorts
[pron_type(i6,std_sp),
  pron_type(i5,std),
  pron_type(i4,zero)],
[],  % Syntax
[mood(i1,ind),
  tense(i1,pres)],
[group(11,16,14,13)],
  ccom_plug(h1,i1),
  leq(i1,h1)],
```

Output

```
[decl(15,h1),  % Semantics
  fine(12,i4),
  pron(110,i4),
  pron(112,i6),
  support(16,i1,i2),
  perspective(14,i1,i6)],
15,  % Main Label
[],  % Sorts
[pron_type(i4,event),
  pron_type(i6,std_sp)],
[],  % Syntax
[mood(i1,ind),
  tense(i1,pres)],
[group(11,16)],
  ccom_plug(h1,i1),
  leq(i1,h1)],
```
Applied rules

(46) \[
[L4:wa(I1,i6)],
[L12:pron(I6),
  prontype(I6, std_sp)]
\leftrightarrow
[L4:perspective(I1, I6)].
\]

(47) \[
[L3:de(I1,i5),
  prontype(I5, std),
  L11:pron(I5)]
\rightarrow \emptyset.
\]

(48) \[
[L10:pron(I4),
  prontype(I4, zero)],
[L2:kekko(I4)]
\leftrightarrow
[L10:pron(I4),
  prontype(I4, event)].
\]

(49) \[
[L12:support(I2,L4),
  group(L1, [L12,L7,L5])]
\leftrightarrow
[L12:support(I2,L4),
  group(L1, [L12])].
\]

Explanation

- The rule (46) resolves the meaning of 'wa' to perspective. The term prontype(I6, std_sp) in the constraint part is effective to restrict the application of the rule to the case.
- The rule (47) eliminates i5. This is a technique \(\sim\) to deal with the de predicates.
- The rule (48) resolves the zero pronoun i4 to an event marker.
- The last rule (49) is originally encoded for the next sentence 10c, but unexpectedly works well for this sentence, too. The rule eliminates the second and third elements of group by brute force when support is involved in the set as the first element. \(\sim\)

Comment

- 'wa' and 'de' are only syntactically analysed.
2.17 10c

Sentence

(10)  c.  T: jikan no hoo wa nanji kara ga yoroshii desu ka

Input

[jikan(13,18),
  whq(113,16,h1),
  yoroshii(14,i1),
  support(112,i2,i4),
  hoo(19,16,i7),
  no(18,i6,i8),
  wa(17,i2,i6),
  ga(16,i1,i5),
  kara(15,i2,i5),
  demonstrative(122,i8,13),
  demonstrative(123,i6,12)],

l13,  % Main Label
=[],  % Sorts
[demontype(i8,undef),
  demontype(i6,undef)],  % Discourse
=[],  % Syntax
[mood(i2,ind),
  tense(i2,pres)],
[group(11,[112,17,15]),
  group(12,[18,19]),
  ccom_plug(h1,i1),
  leq(i1,h1)],

Output

[fine(i4,i1),
  time(16,i1),
  support(112,i2,i4),
  whq(113,16,h1)],

l13,  % Main Label
=[],  % Sorts
=[],  % Discourse
=[],  % Syntax
[mood(i2,ind),
  tense(i2,pres)],
[group(11,[112]),
  ccom_plug(h1,i1),
  leq(i1,h1)],
Applied rules

(50)  \[ L10: jikan(I8) \]  
     \[ \rightarrow \]  
     \[ L10: time(I8) \].

(51)  \[ L10: jikan(I8), \]  
     \[ L22: demonstrative(I8,L3), \]  
     \[ demontype(I8,udef), \]  
     \[ L8: no(I6,I8), \]  
     \[ L9: hoo(I6,I7), \]  
     \[ demontype(I6,udef), \]  
     \[ L7: wa(I2,I6), \]  
     \[ L23: demonstrative(I6,L2), \]  
     \[ group(12,[18,19]) \]  
     \[ \rightarrow [] \].

(52)  \[ L5: kara(I2,I5), \]  
     \[ L6: ga(I1,I5) \]  
     \[ \rightarrow \]  
     \[ L6: time(I1) \].

Explanation

- The rule (51) removes all the terms for "jikan no hoo wa".
- The rule (52) replaces 'time' for 'kara ga'. This is a technique.
- The rule (49) disassembles the group(11,[112,17,15]), deleting the second and third elements.

Comment

- The reason why the rule (51) removes all the terms is that the phrase seems to be redundant. It was tried to interpret the phrase as indicating a topic, which was not adopted after all.
- The rule (52) should be replaced for with a more theoretically plausible rule. One problem is that the input lacks with the terms for 'jikan' (time). Another problem is 'ga' is not semantically analysed. An improvement on these should lead to better rules.
- The terms for 'ga' and 'wa' do not say much.
- This is rather brute translation.
2.18 11a

Sentence

(11)  a. H: ni ji gurai wa doo deshoo ka

Input

\[
\begin{align*}
gurai(19, 12), & \quad \% \text{Semantics} \\
doo(18, 14), & \quad \% \text{Main Label} \\
whq(17, 18, h1), & \quad \% \text{Sorts} \\
support(16, i3, 18), & \quad \% \text{Discourse} \\
wai(13, i3, i1), & \quad \% \text{Syntax} \\
clocktime(12, i1, 2, 0), & \quad \% \text{Tense and Aspect} \\
pron(111, i4)], & \quad \% \text{Scope} \\
17, & \quad \% \text{Prosody} \\
[] & \quad \% \text{Ambiguities}
\end{align*}
\]

Output

\[
\begin{align*}
\text{how about}(17, i3), & \quad \% \text{Semantics} \\
temp_\text{loc}(13, i3, i1), & \quad \% \text{Main Label} \\
clocktime(12, i1, 2, 0)], & \quad \% \text{Sorts} \\
17, & \quad \% \text{Discourse} \\
[] & \quad \% \text{Syntax} \\
[] & \quad \% \text{Tense and Aspect} \\
[] & \quad \% \text{Scope} \\
[] & \quad \% \text{Prosody} \\
[] & \quad \% \text{Ambiguities}
\end{align*}
\]
Applied rules

(53)  [L5:gurai(I1)]-> [].

(54)  [L3:wa(I3,I1)],
     [L2:clocktime(I1,-,-)]  % Context
     <-
     [L3:temp_loc(I3,I1)].

(55)  [L7:whq(L8,H1),
     L8:doo(I4),
     L11:pron(I4),
     prontype(I4,zero),
     L6:support(I3,L8),
     group(L1,[L6,L3]),
     mood(I3,ind),
     tense(I3,pres),
     ccom_plug(H1,L1),
     leq(l1,h1)]
     <-
     [L7:how_about(I3)].

Explanation

- The rule (53) removes gurai(19,i2).
- The rule (54) interprets ‘wa’ as mentioning time.
- The rule (55) translates “doo deshoo ka” to “how about”.

Comment

- The term gurai(19,i2) is referred to by no other terms, thus meaningless. We, therefore, decided to neglect ‘gurai’.
- It is very hard to make sense of the terms for “doo deshoo ka”. For example, it is unclear why doo(18,i4) is referred to from whq(17,18,h1). What is i4? The phrase, ‘doo deshoo’ seems not to be analysed properly.
2.19 12b

Sentence

(12) a. (T: hai)

b. T: watashi no hoo wa kekko desu keredomo

Input

```plaintext
[kekko(13,i4), support(19,i1,i3), keredomo(18,h1),
  decl(17,h2), hoo(16,i5,i6), no(15,i5,i7),
  wa(14,i1,i5), pron(116,i7),
  demonstrative(117,i5,i12),
  pron(113,i4)],
17, % Main Label
[], % Sorts
[promtype(i7, std_sp),% Discourse
demotype(i5, undef),
  promtype(i4, zero)],
[], % Syntax
[mood(i1, ind),
tense(i1, pres)],
[group(11, [19,i14]),% Scope
group(12, [15,i6]),
com_plug(h2,i8),
com_plug(h1,i1),
leq(i1,h2),
leq(i1,h1),
leq(i8,h2)],
[], % Prosody
[] % Ambiguities
```

Output

```plaintext
[decl(17,h2), % Semantics
  fine(13,i4),
  pron(113,i4),
  pron(116,i7),
  perspective(14,i1,i7),
  support(19,i1,i3)],
17, % Main Label
```
Applied rules

(56)  [L4:kekkoo(I2)]
    <->
    [L4:kekkoo(I2)].

(57)  [L4:wa(I1,I5),
       L17:demontype(I5,L2),
       L5:no(I5,I7),
       L6:hoo(I5,I6)]
    <->
    [L4:perspective(I1,I7)].

Explanation

• The rule (57) interprets ‘wa’ as indicating the perspective together with “watashi no hoo”.

Comment

• The rule (57) is rather brute and quite technical. Maybe, it is not appropriate for the transfer module to resolve the meaning of ‘wa’ in this way.

• group(12,[15,16]) should have been removed altogether.
2.20 13a

Sentence

(13)  a. H: wakari mashi ta

Input

[wakari(l1,l1),
  decl(l3,h1),
  arg2(l1,l1,l3),
  arg3(l1,l1,l2),
  pron(16,l3),
  pron(15,l2)],
l3,      % Main Label
[],      % Sorts
[honor_inst(l1),
  prontype(l3,zero),
  prontype(l2,zero)],
[],      % Syntax
[mood(l1,imi),
  tense(l1,past)],
[ccom_plug(h1,l1),
  leq(l1,h1)],
[],      % Prosody
[]        % Ambiguities

Output

[decl(l3,h1),
  see_understand(l1,l1),
  arg1(l1,l1,l3),
  pron(16,l3)],
l3,      % Main Label
[],      % Sorts
[prontype(l3,std_sp),
  honor_inst(l1)],
[],      % Syntax
[tense(l1,pres),
  mood(l1,imi)],
[ccom_plug(h1,l1),
  leq(l1,h1)],
[],      % Prosody
[]        % Ambiguities
Applied rules

(58) \[
\begin{align*}
&[L2:wakari(I1), \\
&L2:arg2(I1,I2), \\
&L2:arg3(I1,I3), \\
&L3:pron(I3), \\
&prontype(I3,zero), \\
&tense(I1,past)] \\
\end{align*}
\]
\[
\leftarrow
\begin{align*}
&[L2:see\_understand(I1), \\
&L2:arg1(I1,I2), \\
&tense(I1,pres)].
\end{align*}
\]

Explanation

- The rule translates ‘wakari’ to ‘see’. The argument structure of the main verb changes.

Comment

- In the input, it seems that `tense(I1,past)` is not correct.
- `honor\_inst(I1)` should have been removed.
2.21 13c

Sentence

(13) c. H: iroiro go muri o onegai shi masu keredomo doozo yoroshiku onegai itashimasu

Input

[muri(13,i9),
negai(14,i8),
doozo(113,h1),
yoroshiku(15,i2),
negai(17,i2),
dec1(111,h2),
iroiro(110,19,h5),
e(19,i1,i9),
arg1(14,i8,i10),
arg3(14,i8,i11),
arg1(17,i2,i4),
arg3(17,i2,i3),
keredomo(12,17,h4,h3),
pron(126,i10),
demonstrative(126,19,i3),
pron(119,i4),
pron(118,i3)]

% Main Label

[111,]

% Main Label

% Semantics

[1,

% Main Label

mood(18,ind),
tense(18,pres),
mood(12,ind),
tense(12,pres)],

% Syntax

[group(11,17,i5)],

com__plug(h5,i3),
com__plug(h4,i4),
com__plug(h3,i1),
com__plug(h3,115),
com__plug(h2,12),
com__plug(h1,11),
leq(13,h5),
leq(14,h4),
leq(10,h4),
leq(12,h2),
leq(11,h3),
leq(11,h1),
leq(113,h3)],

% Prosody

% Ambiguities
Output

[excl(111,thank_you_very much)], % Semantics
111, % Main Label
[], % Sorts
[], % Discourse
[], % Syntax
[], % Tense and Aspect
[], % Scope
[], % Prosody
[] % Ambiguities

Applied rules

- Everything is just thrown away to generate “Thank you very much”.

Comment

- First of all, the sentence is very hard to translate to English compositionally.
- In the input, the honorific 19,11,19 should be expressed as discourse information.
- It is unclear how to understand the meaning of doozo(113,h1). The meaning seems to be better captured as discourse information on i2. How about representing it something like polite(i2) as part of discourse information?
- The same approach could be applied to ‘yoroshiku’, too.
2.22 14a

Sentence

(14) a. T: ie

Input

```
[excl(l1,ie)], % Semantics
l1, % Main Label
\ , % Sorts
\ , % Discourse
\ , % Syntax
\ , % Tense and Aspect
\ , % Scope
\ , % Prosody
\ % Ambiguities
```

Output

```
[excl(l1,no)], % Semantics
l1, % Main Label
\ , % Sorts
\ , % Discourse
\ , % Syntax
\ , % Tense and Aspect
\ , % Scope
\ , % Prosody
\ % Ambiguities
```

Applied rule

```
(59) [L1: excl(ie)] <-> [L1: excl(no)].
```

Explanation  The word ‘ie’ is translated to ‘No’.

Comment

- It is not really convincing just to translate ‘ie’ to the English, ‘No’, because it is not negation actually.
- It is tempting to treat it as a sort of politeness, but it is hard to distinguish it from another ‘ie’ used as negation, which may be transcribed as ‘iie’. Prosodic information may be useful, too.


2.23 14b

Sentence

(14) b. T: kochira koso

Input

[koso(11,12,h1),
pron(13,11)],
11, % Semantics
[], % Main Label
[], % Sorts
[promtype(i1,std_sp)], % Discourse
[], % Syntax
[], % Tense and Aspect
[unbound(14),
leq(14,h1)], % Scope
[], % Prosody
[] % Ambiguities

Output

[pron(13,11),
too(11,12,h1)], % Semantics
11, % Main Label
[], % Sorts
[promtype(i1,std_sp)], % Discourse
[], % Syntax
[], % Tense and Aspect
[ccom_plug(h1,l3)], % Scope
[], % Prosody
[] % Ambiguities

Applied rule

(60) [L1:koso(L2,H1),
unbound(L4),
leq(L4,H1)],
[prom(L3,I1),
prontype(I1,std_sp)]
<->
[L1:too(L2,H1),
ccom_plug(H1,L3)].
Explanation

- The rule translates ‘koso’ to ‘too’ to generate “Me, too”.
- It also deletes the garbage, unbound(14) and leq(14, h1).

Comment

- In the input, the two terms koso(11, 12, h1) and pron(13, i1) have no connections one another. The term pron(13, i1) is, therefore, meaningless, so is prontype(i1, std_sp).
- The two terms unbound(14) and leq(14, h1) have no contribution to the meaning, thus garbage.
2.24  15a

Sentence

(15)  a.  H: hai

Input

[excl(l1,hai)],                  % Semantics
l1,                             % Main Label
[]                              % Sorts
[]                              % Discourse
[]                              % Syntax
[]                              % Tense and Aspect
[]                              % Scope
[]                              % Prosody
[]                              % Ambiguities

Output

[excl(l1,yes)],                 % Semantics
l1,                             % Main Label
[]                              % Sorts
[]                              % Discourse
[]                              % Syntax
[]                              % Tense and Aspect
[]                              % Scope
[]                              % Prosody
[]                              % Ambiguities

Applied rules

(22)  [L1: excl(hai)] <-> [L1: excl(yes)].

Explanation  The ‘hai’ is translated to ‘Yes’.
Comments

- Although the ‘hai’ is translated to the English, ‘Yes’, it does not appear to be correct.

- The translation works fine to the previous utterance 4a (§2.6), where the ‘hai’ is used as a sign for affirmation.

- The ‘hai’ in this case may be better translated to ‘O.K.’. Its meaning is, however, quite subtle and needs more investigation.

- To distinguish these two different uses of ‘hai’, we may need prosodic information.
2.25 15b

Sentence

(15)  b. H: shitsuree shi masu

Input

[[shitsuree(11,11),
decl(13,h1),
arg1(11,i1,i3),
arg3(11,i1,i2),
pron(16,i3),
pron(15,i2)],
13,
[],
honor_inst(i1),
pron(i3,zero),
pron(i2,zero)],
[],
mood(i1,ind),
tense(i1,pres)],
[ccom_plug(h1,l1),
leq(l1,h1)],
[],
[]]

Output

[[greeting(13,bye)],
13,
[],
[],
[],
[],
[],
[],
[],
[]]
Applied rules

(61) \[\text{tense}(I1,\text{pres}),\]
    \[\text{mood}(I1,\text{ind}),\]
    \[L3:\text{decl}(H1),\]
    \[L1:\text{shitsuree}(I1),\]
    \[L1:\text{arg1}(I1,I3),\]
    \[L1:\text{arg3}(I1,I2),\]
    \[L5:\text{pron}(I2),\]
    \[L6:\text{pron}(I3),\]
    \[\text{honor\_inst}(I1),\]
    \[\text{prontype}(I3,\text{zero}),\]
    \[\text{prontype}(I2,\text{zero}),\]
    \[\text{ccom\_plug}(H1,L1),\]
    \[\text{leq}(L1,H1)]\]
\[\leftrightarrow\]
\[\text{[L3:\text{greeting}(bye)].}\]

**Explanation**  Everything is thrown away to generate “Bye”.

**Comment**

- The expression is too colloquial to translate to English. The straightforward translation may be something like “Your honour, I am leaving you.”, which sounds very odd.

- As a translation, ‘bye’ may sound too informal. Another expression, “See you”, sounds more polite as suggested in the introduction.
3 Conclusion

We only mention some problems from general point of view as we have already pointed out problems to each sentence.

- Apart from obvious errors, there are still some words left without semantic analysis such as ‘de’, ‘ga’, ‘wu’, and so on. This forces the transfer module to find a solution depending on the context, which makes it hard to write semantically meaningful translation rules.

- In transfer, we have not adopted any sorting system. We hope we can exploit the function next time.
A The graphic representations

Not all graphic representations are presented here. Simple graphs are not presented as the objective is to make it easier to read VIT terms. The graphs that are the same as others are not presented, too, to avoid redundancy.

A.1 1a input
A.2  1a output
A.3 2a input
A.4 3ab input
A.5 3ab output
A.6 4b input
A.7 5b input
A.8  5b output
A.9 6a input
A.10 6a output

\begin{center}
\begin{tikzpicture}
  \node (i4) at (0,0) {l4};
  \node (l5) at (1,1) {l5};
  \node (h1) at (2,2) {h1};
  \node (l6) at (3,3) {l6};
  \node (i1) at (4,4) {i1};
  \node (i2) at (5,5) {i2};
  \node (i7) at (6,6) {l7};

  \draw[->] (i4) -- (l5);
  \draw[->] (l5) -- (l6);
  \draw[->] (l5) -- (h1);
  \draw[->] (l6) -- (i1);
  \draw[->] (l6) -- (i2);
  \draw[->] (h1) -- (i1);
  \draw[->] (h1) -- (l7);

  \node at (1.5,1) {please};
  \node at (2.5,2) {imp};
  \node at (3.5,3) {wait-for};
  \node at (2.5,4) {arg2};
  \node at (3.5,5) {pron};
\end{tikzpicture}
\end{center}
A.11 6b input
A.12 7b input
A.13 7c input
A.15  8a input
A.16 8a output
A.17 8b input
A.18 9a input
A.19  9d input
A.20 9d output
A.22 10b output
A.24 10c output
A.25  11a input
A.26  11a output
A.28  12b output
A.29 13a input
A.30  13a output
A.31 13c input
A.32 14b input
A.33 14b output
A.34  15b input