Missing part in recursive definition of pi function?

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Stefan Bunk · 3 years ago

On slide 33/38 in the slides for week two you are giving a recursive definition for π.

You say, that this rule applies for any $u \in S$ and $v \in S$

However, I think that at least for u it should be $u \in S \cup \{*\}$, because otherwise the term $\pi(k-1, w, u)$ is always equal to zero.

I am sorry, if I missed something.

10 · flag

Eszter Csernai · 3 years ago

I think I agree - as I understand the recursive definition, for $k = 1$, both u and w, and for $k = 2$, w should be allowed to take the value $$, because they need to correspond to {\it y{0}} and {\it y{-1}}, which are defined to be $$.

Also hope I did not miss something.

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Michael Collins INSTRUCTOR · 3 years ago

You're absolutely correct, this was a bug in the definitions.

I've posted a revised version of the note on HMMs at

http://www.cs.columbia.edu/~mcollins/notes-spring2013.html

You'll see that I've now taken care to include * where appropriate (comments welcome...)

Many thanks for catching this -

Mike

21 · flag

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Michael Collins INSTRUCTOR · 3 years ago

We've now corrected the videos on the Viterbi lectures to fix this bug (thanks again for catching it), and to match the note at http://www.cs.columbia.edu/~mcollins/notes-spring2013.html

The new definitions are close to the old ones, but are now correct. We have

$$\pi(0, ,) = 1$$

as the base case, and the recursive case is now:

For any $k \in 1 \ldots n$, for any $u \in S_{k-1}$ and $v \in S_k$:

$$\pi(k, u, v) = \max{w \in S{k-2}} \left (\pi(k-1, w, u) \times q(v | w, u) \times e(x_k | v) \right)$$

where S_k is defined to be the set of possible tags at position k: more precisely

$S_{-1} = S_0 = \{*\}$

and

$S_k = S$ for $k = 1 \ldots n$

where S is the set of possible tags.

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 Nikhil George Titus · 3 years ago

Are the video lectures present now reflecting the changes.. Or should we refer to ur notes for correction

0 · flag

Anonymous · 3 years ago

It seems that the two videos Viterbi Part 1 & Part 2 are concerned, but not sure whether the video sequences at hand have been corrected as intended.

0 · flag

Michael Collins INSTRUCTOR · 3 years ago

The videos "The Viterbi Algorithm for HMMs" Parts 1, 2 and 3 should now reflect this change.

1 · flag

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FRANCISCO IVANILDO PEREIRA DA SILVA · 3 years ago

HI IM NEW IN COURSE I WILL SAW THW VIDEOS TODAYNIGHT I FROM BRAZIL AND I HOPE GOD LUCK FOR ALL BEST REGARDS.

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