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Stress estimation using action history in distributed environment

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Recently, There is diversified methods for getting opportunities of communication and increasing of that by the development of communication tools and the emergence of various SNS. So that, There is no need to consider the place and timing and people can communicate whenver and wherever because of no effcection of the place and time. For example, There are appearences of Twitter, Facebook and LINE and so on. These tools are very useful.

But There are problems that it is diffcult for people notices status of others in distributed environment. In this case, people can not notice others status and there is possibility of inappropriate timing communication. For example, it is inappropriation of communication timing that communicates to persons having very impotance meeting near future.

There are many many study for communication support and awareness support. For example, integration and supply of status awareness by using moblie terminal suck as mobile phone and smart phone and information of location and schedule. Addtionaly, There is study using busyness for

support appropriated communication. By useing status awareness and busyness , people can avoid inappropited communication timing. In these study, estimates human action and status in the future by using sensors, busyness and schedule information. Further, To support complexed situations, analysis human action rules and learn modeling for future human's action by action histories. And there is a optimization for estimation of busyness and human action in the future in each time learing the observed data.

But making rule of human action, it can not decided the timing of action points because human don't always act to as set rules in systems. And appropriate communication timing can not be estimated by busyness and schedule information.

As the proposal method, This paper proposes stress estimation using human action history in dstributed environment. Stress estimation as the proposal uses stress factor categories "appraisal", "coping as psychological" and "coping as action". In proposal method, makes the original questionnaire to get these 3 stress factor categories. By using the result of data getting from original questionnaire, estimates the coping pattern in next same stress scene. The coping pattern is that 3 coping as action having the heightest probability from 8 coping. The proposal system estimates by using algorithm of Bayesian network and Bayesian estimation.

As the evaluation experimentation, the proposal method is tested. The test content that 16 people answers the original questionnaire in term of one month (from 2013 October 22th to 2013 November 27th). each people answers about 4 contents in the original questionnaire "stress scene", "appraisal", "coping as psychological" and "coping as action". The original questionnaire can be answered at web page and questionnaire seats. By using this result of the original questionnaire, makes coping network and estimates coping as psychological and coping as action at the next same stress scene. the proposal system compares the result of estimated coping

pattern with the result of coping pattern in the original questionnaire at the next same stress scene. In the paper, evaluates the result of compared estimated coping pattern with coping pattern as the result of questionnaire.

As the conclusion, the proposal method estimates coping patterns at the next same sress scene over 70 %. In the case of compared the method of the Bayesian estimation of no separated stress scene, the proposal method is useful and better than Bayesian estimation of no separated stress scene. By analysised the original questionnaire, appeared 140 stress scene, 79 appraisal, 87 coping as psychological and 41 coping as action.

As the consideration, discovers 2 patterns stress scene "familiar stress scene" and "unfamiliar stress scene". The coping pattern estimation rate in the familiar stress scene is better than that of the un familiar stress scene. This means that people knows taking which action is better at the familiar stress scene as well. On the other hands, people doesn't know taking which action is better and makes the feeling of perplexify at the unfamiliar stress scene. Additionaly, result of the original qeustionnaire, defines the relationship of "appraisal" and "coping". Moreover, each stress scene has component propotion rate, so stress scene let us know which stress factor is bigger than others. People considers that of rate, takes better aproachs for communication in the case. As last of consideration, there is difference of coping timing pattern in the stress scene, personalities and kind of coping.

Finaly, the summary of this paper. As the background, there are problems that it is diffcult to communicate each people in distributed envrionment. This reason is that people can not notice others status and state of environment. So solving these problems, this paper propose that analyses stress and estimates near future coping at stress scene. In the result, the proposal method can estimate stress as "appraisal" , "coping as psychological" and "coping as action". The proposal method of estimation rate of stress is better than that of Bayesian estimation of no separated stress

scene. Also by analysising of the original questionnaire, finds relationship between appraisal and coping. coping timing is defferent in each stress scene and personalities. It is considered this point at suport for communication in distributed environment. Future plan, builds the communication support system using stress estimation and evaluates this system in the real comunication.