

User models for helping the helper in peer help networks

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Abstract. *My Ph.D. thesis investigates customised, personalised, and just-in-time help extended to the helper in peer help networks deployed in learning, tutoring, training, and workplace environments. A system called Helper's Assistant that supports peer help networks is being built as part of my thesis that relies on user models to help the helper.*

1 Introduction

Increasingly, communities of computer users are interconnected through the Internet or Intranets. For instance, while on the job, most of the workers in a national banking organisation are interconnected through their computers. Similarly, in a University environment, most of the students are connected through networked computers either from their workplaces (computer labs) or from their homes. Such communities of networked users form what we call "peer help networks". These users possess different degrees of work expertise and request for different types of assistance while performing computer-oriented tasks.

Normally, when users issue a help request, they provide a brief question. In I-Help (Greer et al, 1998), a helpee supplies a question and a help topic from a precompiled list of topics. Using this information and other user model data I-Help identifies a ready, able, and willing helper. Finally, I-Help establishes communication between the chosen helper and the helpee using a chat tool. My research augments this scenario whereby the chosen helper is assisted with an expanded form of help request, a pedagogically sound help plan, and a personalised means to deliver help.

2 User Models to Help the Helper

A system called "Helper's Assistant" is being built on top of I-Help to help the helper (Kumar et al, 1999). It is conceivable that the more the help request information the better the quality of help received from the help system. To that effect, the first step provides the helper with a comprehensive "help-context". The initial help request is augmented with relevant information from the helpee's and helper's user models, a topic hierarchy, a concept network, and possibly queries to the helpee.

The second step in assisting the peer helper involves the generation of a "help-plan". Help plans in Helper's Assistant provide the means to select appropriate help resources and pedagogical strategy. A help plan is derived from a precompiled structure called "help-plan-network" de-

pending on various factors such as helper's preference, helpee's preference, relevance of help material, and distributed accessibility of help tools.

The third step in assisting the peer helper concerns the delivery of help according to the help plan. Depending on the type of help request, the preferences of the helpee, and the preferences of the helper, help can be delivered in different types, modes, and forms. For instance, the preferences of the helpee or the helper, related to the type of help response (pointer, short answer, analogy, clue, etc.), the mode of help response (offline, online, just-in-time), and the form of help response (manual or automated) can be deduced from the helpee's user model.

In addition to these three major steps, Helper's Assistant also incorporates means to offer usage-based statistical assistance to the helper. It will use an unconventional user model called "collaboration model" that stores the knowledge involved in the selection of help components that enables multi-user interaction. Each collaboration model is comprised of a variety of collaboration attributes. There are three types of collaboration models being designed: Helpee-helper model, Helper-System model, and Helpee-System model.

The collaboration attributes of a helpee-helper model represent type of help context, type of helpee's preferences, type of helper's preferences, and the success rates for each participant. To illustrate, a vector containing four values corresponding to the help context type, helpee preferred help response type, helper preferred help response type, and the success-rate of the help session can form an instance of helpee-helper collaboration attribute. Using various combinations of help context type and helper/helpee preferences, one can generate a variety of helpee-helper collaboration attributes. A set of such attributes constitutes a helpee-helper collaboration model that can be populated with values from the case library of help sessions. Over a period of time, the collaboration model can help the researcher or system administrator infer pedagogical rules that can select appropriate help plans for a given set of context type, helper preferences, and helpee preferences.

In a similar fashion, the collaboration attributes of the helper-system and helpee-system collaboration models represent type of help context, help tool preferred by the helpee/helper, and the success rates of help sessions. For example, a vector containing three values corresponding to the help context type, use of relative-debugger tool, and the success-rate for this vector, forms an instance of a collaboration attribute. Collaboration models help the researcher or system administrator evaluate the quality of selection of peer helpers, help plans, and help tools with respect to a given type of help context.

References

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