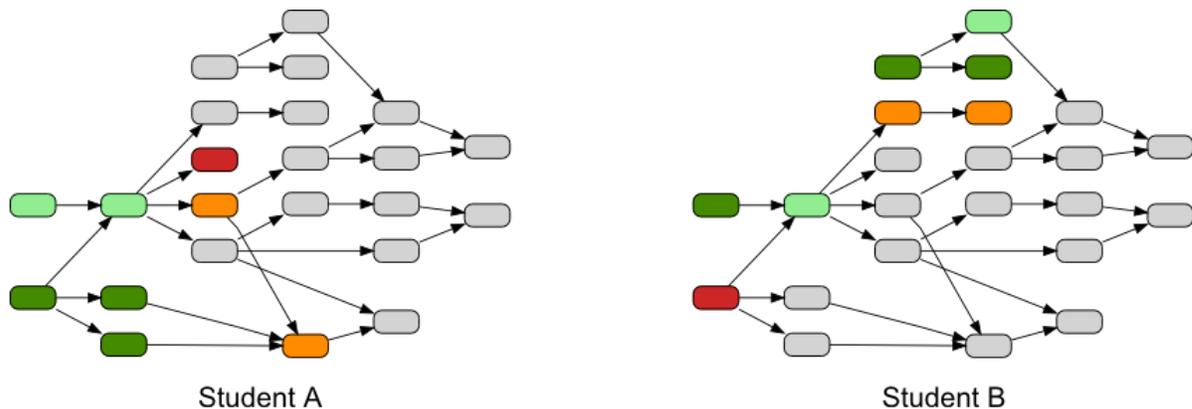


Uncovering Latent Knowledge

April 11, 2014 Dr. Danny Lynch

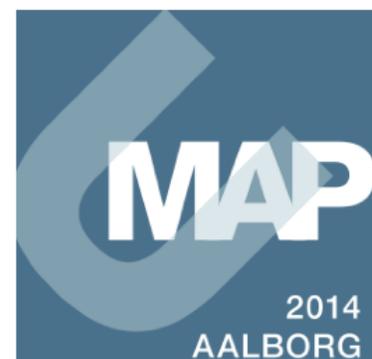
At the beginning of every course, it can be expected that several students already have some knowledge of the syllabus. We call this *latent knowledge* and it's vital for a learning system to quickly and efficiently uncover this. Once determined, it empowers each student to begin a course at the point most appropriate for them. This avoids any frustration and boredom that might occur if initially forced to cover known material.



An example of how two students might have different latent knowledge for the same curriculum network. The colors here represents levels of ability on each item.

Determine Knowledge is the algorithmic method used by Realizeit to uncover this latent knowledge. This approach was developed to be efficient and accurate. That is, determine the latent knowledge by testing students with as few questions as possible and doing so in the shortest amount of time. However as other approaches do exist, we set out to extensively test them against each other. We did this to determine the relative strengths and weaknesses of each algorithm. By fully understanding this, we can advance the algorithm performance and accuracy even further.

The results of our findings are to be published at the [22nd International Conference on User Modeling, Adaption and Personalization](#) (UMAP). This embodies a large research community that work with systems made to adapt and personalize to their individual users (students in our case). The uncovering algorithms are perfect examples of how systems can adapt to student responses and provide a personalized experience for each student. We are delighted to be part of the UMAP community, and will be presenting our results at the 2014 conference to be held in Denmark this July [[full event details](#)]. We would be happy to meet and speak with you there. For those who would like an early preview of the work, the full paper can now be downloaded from our website [[papers section](#) / [pdf](#)].





Dr. Danny Lynch

Danny forms part of the research team at Realizeit. His work focuses on advancing the algorithms and technology that are central to driving the Realizeit ecosystem, while also exploring new and novel components. He strives to further the research field of educational technology with the ultimate aim of benefiting the learner. Danny holds a Joint Honors Bachelor's Degree in Mathematics and Theoretical Physics from University College Cork, and also has a PhD in Mathematics from University College Dublin. He is a Government of Ireland Scholar, and has completed specialized research projects in several areas such as Homomorphic Encryption, Nano-transistor Design, and Data Analysis. Moreover, Danny has also spent numerous years in the education field. He has lectured at University College Dublin, and has taught high school students at various settings.