

1. Publishable Summary

1.1 Summary

Technology has always had a direct impact on how and what humans remember. This impact is both inevitable and fundamental – technology radically changes the nature and scale of the cues that we can preserve outside our own memory in order to trigger recall. Such change is not new – we have seen the transition from story-telling to written books, from paintings to photographs to digital images and from individual diaries to collective social networks. However, recent advances in (i) the near-continuous capture of memory cues, (ii) in data storage and the widespread mining of stored cues for proactive presentation, and (iii) the presence of ubiquitous displays provides many new opportunities for displaying memory cues to trigger recall.

In RECALL we aim at a targeted breakthrough to create a memory augmentation technology that provides the user with the experience of an extended and enhanced memory, but is based on improvements in the collection, mining, and presentation of appropriate information to facilitate cued memory recall. In particular, the proposed project aims to lay the scientific foundations for a new technology eco-system that can transform the way humans remember in order to measurably and significantly improve functional capabilities while maintaining individual control.

In the first 12 months of the project, we created an interdisciplinary team and established common ground between researchers in distributed systems, human computer interaction, information retrieval, and the psychology of human memory. The RECALL-house experiment, a week long, large-scale experiment in pervasive data collection for memory augmentation, provided insights into the challenges in collecting personal multimedia information in a realistic setting. The results indicate that personal recordings captured on a massive scale have great potential for cuing recall and for remembering. At the same time, we experienced that enabling privacy-preserving capture and access strategies requires a complex negotiating process. We have experimentally assessed capture from different perspectives (e.g., first person vs. environment view, and head worn vs. chest worn camera), presentation format (e.g., ambient displays vs. active reviewing), and content types used for memory augmentation (e.g., audio, video, or images, and single vs. multiple perspective). In addition, psychological memory experiments have provided clear evidence that the spontaneous accessibility to studied events can be enhanced or impaired in a later test following an earlier review of a subset of these events. In these experiments, we also identified factors that enhanced both the retrieval practice and the retrieval induced forgetting observed in laboratory environments.

After its first year, the project has already delivered a first set of empirically-validated insights into the use of personal capture technologies for memory augmentation. In particular, we have contributed to the understanding of how different data sources can contribute to personal memory augmentation. Through a range of user-centred methods and explorations we have started to identify strategies for capturing image- and video-based lifelogs, researched new architectures and associated security and privacy challenges in memory augmentation, and described an initial set of options for providing compressed yet meaningful presentation of lifelogging data. We published our findings in more than a dozen articles in peer-reviewed workshops, conferences, and journals. Additionally we established an initial international research community in the area of technical memory

augmentation: project members organized a week-long multi-disciplinary Dagstuhl seminar with 30 experts in related fields. We also organised an international workshop at Ubicomp 2014 - one of the premier conferences in the field of future computing systems - on “Augmenting the Human Mind”, which attracted over 20 researchers from Europe, America, and Asia and helped RECALL project members shape the research agenda of memory augmentation.

On the basis of our work so far, we plan to create technologies and interventions over the next 24 months that allow us to assess and measure the impact of memory augmentation technologies in home and work environments. The empirical work is designed to assess specific questions with regard to the design and construction of memory augmentation tools, as well as to help us find insights that provide us with the empirical basis for new theories of memory augmentation.

1.2 Contact Details

For further details on RECALL please contact the coordinator at the address below:

Prof. Nigel Davies, InfoLab21, Lancaster University, LA1 4WA, UK

Project web site : <http://recall-fet.eu/>