2nd Workshop on Using Video in Computer Science Education

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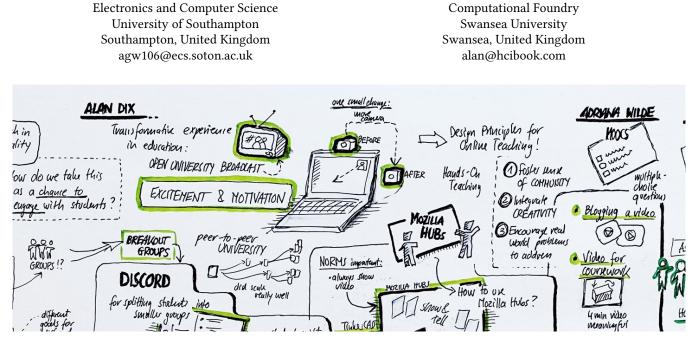Swansea, United Kingdom
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Figure 1: Making the leap onto research from practice: The collective expertise of participants using video in their teaching, together with the challenges and opportunities that the next academic year will bring, offers new opportunities for Computer Science Education research. (*Excerpt of a drawing by Nic Marquardt, available in full at https://amp.ubicomp.net/hciedu/*)

ABSTRACT

Despite a growing maturity of video technology over several decades, its adoption in higher education institutions (even in the context of teaching technical subjects in computer science) had been rather limited until recently. New obligations on supporting learning amidst social distancing measures, however, offer the opportunity to incorporate video more widely in computer science education, as well as of studying formally the effects of such a shift in pedagogical style.

This workshop builds on the success of previous events by the organisers and aims to give a space to participants to reflect on their planned use of video in computer science education and discuss opportunities for cross-institutional research.

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CCS CONCEPTS

• **Social and professional topics → Computing education**.

KEYWORDS

Tools to aid computer education, video, action research, cross-institutional research.

1 INTRODUCTION

The first time a complete course was delivered through the medium of video was over forty years ago (using videodiscs and personal computers [6]). However, despite a growing maturity of video technology, and research suggesting that, under certain conditions, video can have a positive effect on student engagement [4], its use in computer science education is still largely considered as innovative, with game programming as a notable example [5].

In general, while over a number of years there has been a huge uptake in purely online education (e.g MOOCs), the heterogeneity of content and style in traditional universities have been barriers

to effective use of data and reuse of educational materials [1]. Furthermore, the time costs of video production and the difficulties of creating engaging material have discouraged many from creating their own materials. That is, there are major pedagogic and technical research challenges in order to make effective use of video-based materials in face-to-face computer science education.

In addition, the role of the video is often seen narrowly in terms of a form of lecture replacement. In fact, video can be used in many ways [11] including student assessment, feedback to students, and the creation of peer-learning materials. Furthermore, video does not merely have to be used on its own as a form of educational television show. For example, in an earlier discussion session following on form our last HCIvideoW workshop, the issue was raised of how to allow students to share physical prototypes when designing a new digital device. As a response to this a simple tool was created to enable snippets of video to be integrated into a finite-state machine representing the interaction capabilities of the physical device [2]. Despite the plethora of video sharing platforms and the oft assumed media literacy of 'digital natives', there is still much to learn in terms of the rich educational uses of video as well as many challenges in the creation of effective and usable technologies.

In this paper we present a workshop on video for computer science education. We list the planned activities within the workshop in section 2 and the organisational requirements in section 3. The viability of the workshop will be assessed in terms of its expected outcomes (section 4), and authors' experience organising similar events and giving talks on the topic (section 5 respectively). Finally, the conclusions and future work are presented in section 6.

2 ACTIVITIES

The two-hour workshop will be organised as follows (approximate times are given, with some slack to allow for transitions before and after the workshop):

- (15') Short introduction (Adriana). Aims of the workshop including presentation of outcomes of previous events.
- (15') Historical context of research on video (Alan). Context of the evolution of the use of video for education, and its barriers for adoption.
- (15') First activity (all participants, ideally in breakout rooms for some of the time). Discussion of *challenges* surrounding the use of video in the teaching context of the participants. What are our current stumbling blocks?
- (15') Second activity (all, as above). Discussion of *opportunities* surrounding the use of video in the teaching context of the participants. What works well?
- (15') Third activity (all). Discussion around *research questions* of interest to this community: making the leap from practice to research. What can we study?
- (30') Plenary (Alan). Future directions of research on video in Computer Science Education, action plan.

3 ORGANISATIONAL REQUIREMENTS

Depending on numbers of participants, facilities for discussion in smaller groups (in breakout rooms) might be required. Organisational support on managing the participation and moderating the chat session will be welcomed.

4 EXPECTED IMPACT AND OUTCOMES

The most tangible outcome of the first edition of this workshop (listed as number (3) in section 5) was a book chapter on a taxonomy for video for HCI education [11], where we looked at nine ways of using video for teaching and learning: video being produced for (and by) educators, students and third parties.

An immediate outcome of this edition of the workshop is the identification of research questions of common interest by the community. Immediately after the workshop we will report this on the workshop microsite, but later we will consider more formal ways to follow this up as a collaborative endeavour

Other measures of impact will be considered based on best practice [8]. We are mindful that this is an extremely live and critical area for many and that some swift and actionable outcomes will be useful. However, we are also aware that for the very reasons it is so time critical, many attendees will be very busy in the time following the workshop. We will attempt to balance the short term wins and longer term actions.

5 RECENT EXPERIENCE ORGANISING WORKSHOPS

The workshops listed below have been co-organised in the last four years by either (or both) of the authors:

- Three editions [3, 12, 13] of the *HCI and the Educational Technology Revolution: An HCI Educators Workshop at the ACM International Conference on Advanced Visual Interfaces (AVI)* . https://hcied.adalsimeone.me
- *History of HCI*, British HCI virtual workshop, 7 July 2020. https://hcibook.net/hcihistory/
- *Doctoral Consortium*, British HCI virtual event, 6 July 2020. https://hcibook.net/dc-bcshci2020/
- *#HCIvideoW: a virtual workshop on Video for HCI Education* (16 and 23 April 2020) and periodical discussions over Zoom. https://hcibook.net/hcivideow/
- *Re-imagining the Student Research Project*, Computational Foundry, Swansea University, 4 Nov 2018. https://alandix.com/academic/conf/reimagining-student-research-2018/
- *Workshop on Using Video in Computer Science Education*, 7 August 2018, St Andrews, UK.
- *SICSA workshop on Learning Analytics for improving evidence-based teaching*, 6 August 2018, St Andrews, UK.

In addition to the above, the authors have given talks on related topics at events in recent months: such as "HCI teaching and assessment in higher education can borrow an idea or two from MOOC learning" [7], and "Teaching HCI and Interaction Design remotely: 'amateur' video making" [9], and "Video didn't kill the radio star: on teaching and learning in the new normal" [10].

6 CONCLUSIONS AND FUTURE WORK

We anticipate the workshop will be of interest to the practitioners and researchers of Computer Science Education in the UK and Ireland specifically, given the challenges that educational institutions are facing amidst the current pandemic.

As we gaze into the future, we envisage video being used in higher education not merely as an emergency response to a temporary problem: the new normal in HE is predicted to be blended learning. Video is here to stay, and with it, the opportunities to study its educational impact in what is possibly the largest social experiment in education in modern history.

7 AUTHORS BIOS

Adriana Wilde is a Fellow of the HEA (now AdvanceHE) since 2013, and has a lifelong interest in computer science and education. She holds a B.CompSc.(Hons) degree from the Universidad Central de Venezuela, an MSc in Computer Science by the Universities of Berne, Fribourg and Neuchâtel in Switzerland (with specialism in Distributed Systems and a minor in Education), and is a PhD candidate at the University of Southampton. She also holds various teaching qualifications, including a PGCE in Post-Compulsory Education and Training, and has taught in diverse educational environments, including schools, further education colleges and universities in four different countries. Her main research interests are in Computer Science Education, in particular on learner engagement in digitally-mediated peer-supported environments. Adriana's recent appointments include a Teaching Fellowship at the University of Southampton, an Associate Lectureship at the University of St Andrews and will soon start a Lectureship at the University of Winchester. Adriana serves at ACM-W Europe.

Alan Dix is the Director of the Computational Foundry at Swansea University, and the mission of the Foundry very much matches his own personal goals: to do world-class research that makes a difference to real people. In Alan's own career this has included seminal work in human–computer interaction (HCI), including one of the core textbooks in the area, foundational work on formal methods and the user interface, and the earliest academic papers on mobile interfaces, on privacy and on gender and ethnic bias in machine learning. In 2013 he was elected as a member of the ACM SIGCHI Academy, one of the highest accolades for research in HCI. However, he has also been involved in a wide variety of practical commercial and non-commercial applications including agricultural spayers, submarine design, educational technology, intelligent internet interfaces, and technology for rural communities. His techniques are often eclectic, not least his one thousand mile walk around the perimeter of Wales that combined a technical investigation of technology at the margins, with more philosophical and artistic exploration. Not surprisingly he has also written and taught academically and practically about technical creativity.

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