Stemming the Tidal Flow from Engineering to Liberal Arts: An XR-Enhanced Non-Judgmental Mentor

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Abstract*: The emerging definition of XR is discussed, but as a placeholder in this abstract: XR=VR+AR+x. One major thesis of this paper is that XR has promise in addressing a major impediment to adequately providing sufficient numbers of engineering professional to sustain the technical ascendency of the United States and its allies. That impediment is the flow on US university campuses from Schools of Engineering over to Colleges of Arts and Sciences before the students' second years at the university. Many who have studied this issue cite data supporting that on the order of 50% of incoming engineering students abandon the rigors of their technical training for the more appealing entertainment afforded in the schools on the other side of the campus. The authors cite their own experiences with the divergent environments at engineering schools and arts and sciences colleges, lack of caring mentors in early years, sink or swim traditions, and ineffective efforts to stem this tide. Also related are anecdotal suggestions that this was not reflective of a low regard for the engineering profession as it is actually practiced, but may also reflect a poorly conveyed image of both the engineering student and professional environments, exacerbated by the dearth of and poor skills held by mentors who could have ameliorated these hindrances to higher graduation rates in the engineering disciplines. The ability of Computer-Generated Mentors (CGM's) to compensate for many of these short-comings is advanced, outlined and justified. Some early examples of such virtual-mentorships are presented to show the promise, with an explication of both their limits and opportunities. Current responsive CGM's with their Natural Language Processing(NLP) capabilities are discussed and the enhancing impact of XR in addressing the current short-comings laid out. Making the CGM's more able to initiate new conversations and to make critical segues in existing conversations is presented. A road-map is set forth for future research, including the necessity for establishing an accepted body of terminology, inter-program data exchange standards, figure of merit definitions, and metrics assessment quantification. The paper concludes with an analysis of the potential and an identification of the risks in such a reaction to the issues at hand.*

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