

# Proposal: Unaligned Expectations in Universities and Industry for New Graduates in Computer Science and Software Engineering

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## ABSTRACT

*Abstract*-There is a widespread agreement that new graduates from computer science and software engineering does not always possess required skills, abilities or knowledge when joining software industry. The phenomenal question is what are the expectations and motivations for students, teachers in the field of computer science and software engineering? Following that what employers expect from new graduates in this field? Is there any gap between the expectation of these groups? How would be the best practice to limit the possible gap. In this paper and in our project we will discuss about available research articles and analyze the results. We will initially provide survey and sending it to a smaller group in this field such as our classmates. Then, we will provide the official survey and send it to many people outside this classroom, who are active in this field as teacher, student, or employers. We will analyze our results and report it in our paper.

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## \*\*\* PROPOSAL TODO ITEMS \*\*\*

A feedback: What is the underlying educational problem or approach you see as a problem? What are the main problem(s) with this approach or problem? How can I fix it?

1- What are the research background that shows the motivation and expectations for student/teachers/employers in cs/se program?

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2- what are the problems to limit the gap for new graduates in finding a new job after school? Why there is a gap in the new graduate skills and employer expectations?

3- what are some methodology that can shorten this gap? We can compare ivy league schools and other ones to see the differences and rate of employment after graduation?

## \*\*\* INTRODUCTION \*\*\*

One of the essential elements of a good software is to have a good software engineer (Paul Luo Li et al., 2015). The question is what makes a great software engineer? (Paul Luo Li et al., 2015) All different groups are looking into this question: employers want to hire a good software engineer, universities want to train a good engineer and new graduates want to become great (Paul Luo Li et al., 2015). Paul Luo Li et al. mention some of the employer's expectations for hiring software developers (Paul Luo Li et al., 2015). The research indicates that the expert engineers are more productive in terms of producing faster solutions, produce more amount of code in the same amount of time, and write code with much fewer bugs (Paul Luo Li et al., 2015).

Hewner and Guzdzial investigate a game company on what are the employer expectations from new graduates (Hewner and Guzdzial, 2010). They identify two of the essentials skills or expectations are high programming skills as well as people skills such as working in a team and collaborating with other people (Hewner and Guzdzial, 2010). McConnell argue that software developers' personality traits like intellectual honesty, curiosity and being humble about their intelligence are important skills in addition to technical skills (McConnell, 2004). Hewner describes the mismatch between a student's expectations on skills they hope to learn and what they are taught in an introductory computer science class (Hewner, 2011). He notes that students come to the course with preconception about what they will learn in that computer science course (Hewner, 2011). The educators mention some of the students preconceptions as below (Hewner, 2011):

- Students expect to learn "advanced features" in application softwares.
- They expect to do IT work such as assembling computers from parts and configure routers.
- They expect to learn only about programming and not the

architecture and theory.

Teaching computer science is different from teaching other subjects (Guzdial, 2014, <https://cacm.acm.org/blogs/blog-cacm/174930-what-it-takes-to-be-a-successful-high-school-computer-science-teacher/fulltext>) Good teachers should be able to read the code and help students to write code by hand off from computers (as well as at the computer) (Guzdel, 2014). On the other hand, the less successful teachers focus heavily on assessments and readings (Guzdel, 2014).

The technology and computer science industries are growing so fast (Ayofe and Ajetola, 2009). Therefore, the companies are looking for the graduates, who are able to use the latest technologies. However, the companies criticize the universities curriculum doesn't meet the practical issues in industry (Ayofe and Ajetola, 2009).

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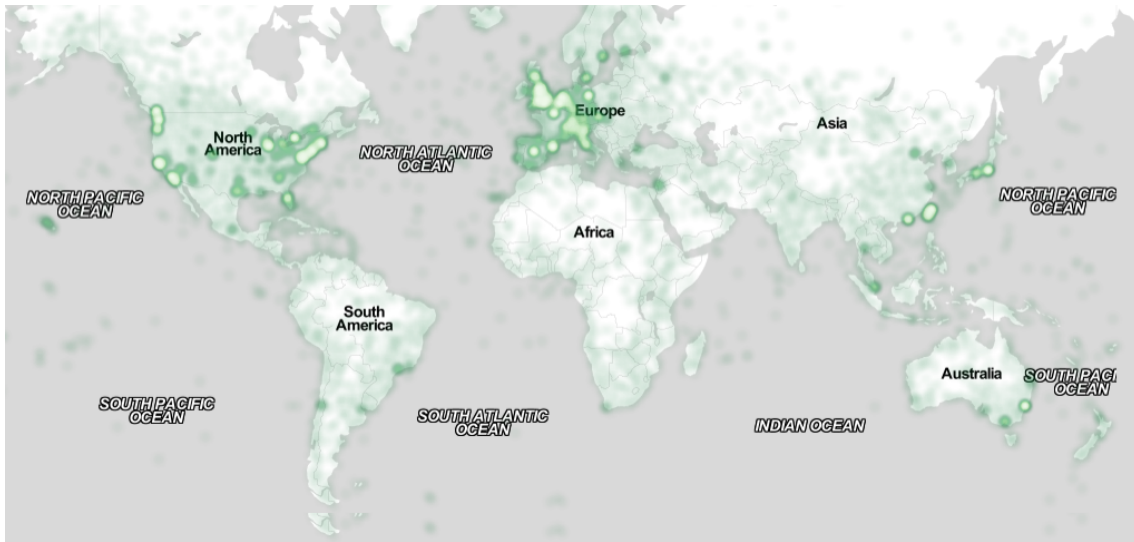


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## REFERENCES

1. ACM. 1998. How to Classify Works Using ACM’s Computing Classification System. (1998).  
[http://www.acm.org/class/how\\_to\\_use.html](http://www.acm.org/class/how_to_use.html).
2. R. E. Anderson. 1992. Social Impacts of Computing: Codes of Professional Ethics. *Social Science Computer Review* December 10, 4 (1992), 453–469. DOI:  
<http://dx.doi.org/10.1177/089443939201000402>
3. Anna Cavender, Shari Trewin, and Vicki Hanson. 2014. Accessible Writing Guide. (2014).  
<http://www.sigaccess.org/welcome-to-sigaccess/resources/accessible-writing-guide/>.
4. @\_CHINOSAUR. 2014. "VENUE IS TOO COLD" #BINGO #CHI2014. Tweet. (1 May 2014). Retrieved February 2, 2015 from [https://twitter.com/\\_CHINOSAUR/status/461864317415989248](https://twitter.com/_CHINOSAUR/status/461864317415989248).
5. Morton L. Heilig. 1962. Sensorama Simulator. U.S. Patent 3,050,870. (28 August 1962). Filed February 22, 1962.
6. Jofish Kaye and Paul Dourish. 2014. Special issue on science fiction and ubiquitous computing. *Personal and Ubiquitous Computing* 18, 4 (2014), 765–766. DOI:  
<http://dx.doi.org/10.1007/s00779-014-0773-4>
7. Scott R. Klemmer, Michael Thomsen, Ethan Phelps-Goodman, Robert Lee, and James A. Landay. 2002. Where Do Web Sites Come from?: Capturing and Interacting with Design History. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '02)*. ACM, New York, NY, USA, 1–8. DOI:  
<http://dx.doi.org/10.1145/503376.503378>
8. Nintendo R&D1 and Intelligent Systems. 1994. *Super Metroid*. Game [SNES]. (18 April 1994). Nintendo, Kyoto, Japan. Played August 2011.
9. Psy. 2012. Gangnam Style. Video. (15 July 2012). Retrieved August 22, 2014 from  
<https://www.youtube.com/watch?v=9bZkp7q19f0>.
10. Marilyn Schwartz. 1995. *Guidelines for Bias-Free Writing*. ERIC, Bloomington, IN, USA.
11. Ivan E. Sutherland. 1963. *Sketchpad, a Man-Machine Graphical Communication System*. Ph.D. Dissertation. Massachusetts Institute of Technology, Cambridge, MA.
12. Langdon Winner. 1999. *The Social Shaping of Technology* (2nd ed.). Open University Press, UK, Chapter Do artifacts have politics?, 28–40.