

MICHIGAN STATE

U N I V E R S I T Y

02/10:

Resume Writing and Interviewing

The Capstone Experience

Dr. Wayne Dyksen

Department of Computer Science and Engineering
Michigan State University

Spring 2014



*From Students...
...to Professionals*

Purpose

- Resume
 - Get Noticed
 - Get an Interview
 - Get in the Door
- Interview
 - Tell Your Story
 - Get a Good First Job
 - Start a Successful Career



Caveats Resume Writing & Interviewing

- Partly...
 - Science (Spock)
 - Art (Captain Kirk)
- Lots of Opinions
 - Varied
 - Sometimes Conflicting
- Always Exceptions to Every Rule
- Do what works for you.



Resume Writing and Interviewing

➤ Resume Writing

- Interviewing



Resume Challenges

- Competition
 - 100's or 1,000's of 10,000's of Resumes
 - Lots Similar
 - Lots Qualified
- Typical Usage
 - Visual Scan (< 10 Seconds)
 - Optical (Machine) Scan
 - Often Not Read in Detail
 - Often Discarded

How will your resume stand out?



Resume *Nota Bene*

Every Last Detail Matters

If...

- ...cannot find relevant information in 10 seconds
- ...email wrong and bounces back
- ...phone number wrong
- ...not visually appealing
- ...not professional looking
- ...no answer and no voicemail
- ...etc...

then...

- ...pitch your resume and move on to the next one



Resumes 101

- Exactly One (Full) Page
 - Not More
 - Not Less
- Simple Formatting
(Machine (Optical) Scan-able)
- Honest
- Contains...
 - Contact Information
 - Objective
 - Education
 - Skills
 - Experience
 - Other Activities



Contact Information

(1 of 3)

- Name
- Email Address
(Use “Professional” Email Address)
 - No
 - TheGamingWizard@hotmail.com
 - HotToTrot@gmail.com
 - Yes
 - dyksen@msu.edu
 - wayne@dyksen.com
 - wayne.dyksen@gmail.com
- US Mail Address
 - Current (Your Apartment)
 - Permanent (Your Home Address (Parents’?)
(What if I want to contact you after you leave MSU?)



Contact Information

(2 of 3)

- Phone
 - Current
 - Probably Not Your Apartment Phone (Why not?)
 - Your Cell Phone
 - ❖ No Cell Phone? Get one.
 - ❖ Providers offer pay-as-you-go service.
 - Permanent
 - Your “Home” Phone (Parents’)?
 - Your Cell Phone?
 - What if I want to call you after you leave MSU?
 - Include Area Codes
 - Get “Voicemail” for All Phones



Contact Information

(3 of 3)

• Phone

▪ Fix your voicemail “not here” messages.

○ No

❖ “Hey there! You’ve reached the voicemail of the hottest person at MSU. Leave your number and I’ll give you a ring but only if you’re lucky.”

❖ “I’m not here. Leave a message.”

❖ “Hi. I’m sorry I missed your call. Please leave me a message and I’ll get back to you. Thanks for calling and have a great day.”

○ Yes (Include Your Name!)

❖ “Hi. This is Wayne Dyksen and you’ve reached my voice mailbox. Please leave me a message and I’ll get back to you. Thanks for calling and have a great day.”



Objective

- Very Concise (One Line)
- Indicate internship or permanent employment.
- Avoid flowery BS.
- Examples
 - To secure a summer internship as a software developer.
 - To secure permanent employment as a software engineer.
 - To secure permanent employment as a software engineer that utilizes and expands my skills in computer science.
- Be specific only if you really mean it. Why?
 - To secure permanent employment as a database administrator
 - To secure permanent employment as a network administrator.



School Address
Calvin College
Grand Rapids, MI 49546
(616) 555-1234

Bob Dyksen
bob@dyksen.net

Permanent Address
2175 Burcham Dr.
East Lansing, MI 48823
(517) 555-1212

Objective To secure a full time position as a software engineer that utilizes my skills and expands my knowledge in computer science.

E.J. Dyksen

School Address

2148 Raspberry Court SE, Apt H
Grand Rapids, Michigan 49546

ej@dyksen.net
(517) 555-1234

Permanent Address

2175 Burcham Drive
East Lansing, Michigan 48823
(517) 555-1212

Objective

Secure an internship that will expand my knowledge and experience in computer science.



Interview Tip

- Be ready to answer questions like...
 - “What do you like to do?”
 - “What kind of positions interest you?”
 - “Where do you want to be in five years?”
- Know Positions
 - Program Manager (PM) or Developer (Dev)
 - Associate Software Developer
 - Associate/Sr. Consultant
 - Etc...



Your GPA

- Used by Companies for Screening
 - Use Varies by Company
 - If GPA < Threshold then No Interview?
 - Threshold Varies by Company
- On Resume
 - Probably. Almost Certainly (IMHO)
 - Easy to Find
 - If not there...
 - I'm thinking...
 - I'm going to...
 - Remove After First Job



So-So GPA's

- Compute “Sub” GPA's
 - Overall vs CSE
 - Freshman vs Sophomore Through Senior
 - Freshman/Sophomore vs Junior/Senior
 - Freshman, Sophomore, Junior, Senior
 - Etc...
- Give a Good Explanation
 - Was Immature. Grew Up.
 - Not Motivated When Freshman. Am Now.
 - Worked 40 Hours/Week to Pay for School.
 - Etc...



Education

- Degree BS
- Major Computer Science
 - Cognate Business
 - Minor Mathematics
 - Date Expected May 2014
- Institution Michigan State University
- GPA
 - Cumulative 3.50/4.0
 - CSE 3.70/4.0
- Relevant Courses
 - Number CSE 231
 - Title Introduction to Programming
 - Topics in Parentheses (Python)
- Non-MSU Institutions
 - May Include Other Colleges/Universities
 - Do Not Include High School



Cognate

- Highly Valued by Companies
- Leverage
 - On Resume
 - During Interview
- “Cognate”
 - Unknown Term
 - Confusing Label On Resume
 - Label As “Cognate (Minor)”
 - Explain Cognate Like a Minor
 - Be Careful to Not Misrepresent as Official Minor



School Address

Calvin College
Grand Rapids, MI 49546
(616) 555-1234

Bob Dyksen

bob@dyksen.net

Permanent Address

2175 Burcham Dr.
East Lansing, MI 48823
(517) 555-1212

Objective

To secure a full time position as a software engineer that utilizes my skills and expands my knowledge in computer science.

Education

B.A., Computer Science, Expected December 2002

Calvin College, Grand Rapids, MI

- CS GPA: 3.50/4.0, Cumulative GPA: 3.13/4.0
- CPSC 186, Introduction to Data Structures with C++ (C++, Visual Studio 6.0)
- CPSC 210, Web Site Administration (HTML, CGI, Perl, Apache Web Server)
- CPSC 230, Data Structures and Algorithms (C++, Java, Visual Studio 6.0)
- CPSC 247, Software Engineering (C, UML)
- CPSC 270, Operating Systems (C++, Java, Perl)
- CPSC 300, Computer Graphics (OpenGL)
- CPSC 330, Databases (mySQL, Oracle, Java)
- CPSC 370, Networking (TCP, UDP)
- CPSC 380, Programming Languages (C++, ADA, LISP, Smalltalk)
- CPSC 392, Ethics in Computing
- CPSC W80, Cryptography and Computer Security
- ENGR 220, Computer Architecture (SPARC/MIPS, Assembly Programming)



School Address

Calvin College
Grand Rapids, MI 49546
(616) 555-1234

Bob Dyksen

bob@dyksen.net

Permanent Address

2175 Burcham Dr.
East Lansing, MI 48823
(517) 555-1212

Objective

To secure a full time position as a software engineer that utilizes my skills and expands my knowledge in computer science.

Education

B.A., Computer Science, Expected December 2002

Calvin College, Grand Rapids, MI

- CS GPA: 3.50/4.0, Cumulative GPA: 3.13/4.0
- CPSC 300, Computer Graphics (OpenGL)
- CPSC 330, Databases (mySQL, Oracle, Java)
- CPSC 370, Networking (TCP, UDP)
- CPSC 380, Programming Languages (C++, ADA, LISP, Smalltalk)
- CPSC W80, Cryptography and Computer Security
- ENGR 220, Computer Architecture (SPARC/MIPS, Assembly Programming)

Course Related Projects

- Linux Kernel Network Router (CPSC 370)
 - Implemented a kernel-resident network router.
 - Routed IP network traffic across two or more NICS.
 - Optimized routing times via cached routes.
- Virtual Private Network (CPSC W80)
 - Designed a virtual private network protocol.
 - Implemented a VPN via TCP/IP tunneling.
 - Utilized DES3 cryptography for secure IP data packets.



E.J. Dyksen

School Address

2148 Raspberry Court SE, Apt H
Grand Rapids, Michigan 49546

ej@dyksen.net
(517) 555-1234

Permanent Address

2175 Burcham Drive
East Lansing, Michigan 48823
(517) 555-1212

Objective

Secure an internship that will expand my knowledge and experience in computer science.

Education

BA, Computer Science

Expected May 2008

Calvin College

Grand Rapids, Michigan

- CS 108, Introduction to Computing (Java)
- CS 112, Introduction to Data Structures with C++ (C++)
- CS 212, Data Structures and Algorithms (Java)
- CS 214, Programming Language Concepts (Java, Lisp, and Scheme)
- CS 232, Operating Systems and Networking
- CS 262, Software Engineering
- CS 352, Computer Graphics
- ENGR 220, Introduction to Computer Architecture (SPARC Assembly)
- MATH 161, Calculus I
- MATH 156, Discrete Mathematics for Computer Science
- MATH 256, Discrete Structures and Linear Algebra



Interview Tip

- Be ready to answer questions like...
 - “So, what did you do in CSE 422?”
 - “Tell me about a favorite course.”
 - “Tell me about Linux Kernel Network Router.”
- Know Your Courses
 - Topics
 - Books and Readings
 - Projects
- Know Some Projects in Depth
 - Requirements
 - Implementation
 - Complexities
 - Cool Features



Skills

- Simple List
 - Languages
 - Operating Systems
 - Software Systems
 - Software Packages
- Avoid
 - Relative Trivialities (e.g., Microsoft Word)
 - Weak or Non-Existent Skills
 - BS (Effective Team Member, Customer Oriented, etc.)
- Possibly Classify (But Only If Room)
 - Familiar
 - Proficient
 - Certified



School Address

Calvin College
Grand Rapids, MI 49546
(616) 555-1234

Bob Dyksen

bob@dyksen.net

Permanent Address

2175 Burcham Dr.
East Lansing, MI 48823
(517) 555-1212

Objective

To secure a full time position as a software engineer that utilizes my skills and expands my knowledge in computer science.

Education

B.A., Computer Science, Expected December 2002

Calvin College, Grand Rapids, MI

- CS GPA: 3.50/4.0, Cumulative GPA: 3.13/4.0
- CPSC 186, Introduction to Data Structures with C++ (C++, Visual Studio 6.0)
- CPSC 210, Web Site Administration (HTML, CGI, Perl, Apache Web Server)
- CPSC 230, Data Structures and Algorithms (C++, Java, Visual Studio 6.0)
- CPSC 247, Software Engineering (C, UML)
- CPSC 270, Operating Systems (C++, Java, Perl)
- CPSC 300, Computer Graphics (OpenGL)
- CPSC 330, Databases (mySQL, Oracle, Java)
- CPSC 370, Networking (TCP, UDP)
- CPSC 380, Programming Languages (C++, ADA, LISP, Smalltalk)
- CPSC 392, Ethics in Computing
- CPSC W80, Cryptography and Computer Security
- ENGR 220, Computer Architecture (SPARC/MIPS, Assembly Programming)

Skills

C, C++, ADA, Smalltalk, Lisp, Java, Perl, HTML, Windows 2000/XP, UNIX, Linux, Visual Studio 6.0



E.J. Dyksen

School Address

2148 Raspberry Court SE, Apt H
Grand Rapids, Michigan 49546

ej@dyksen.net
(517) 555-1234

Permanent Address

2175 Burcham Drive
East Lansing, Michigan 48823
(517) 555-1212

Objective

Secure an internship that will expand my knowledge and experience in computer science.

Education

BA, Computer Science

Expected May 2008

Calvin College

Grand Rapids, Michigan

- CS 108, Introduction to Computing (Java)
- CS 112, Introduction to Data Structures with C++ (C++)
- CS 212, Data Structures and Algorithms (Java)
- CS 214, Programming Language Concepts (Java, Lisp, and Scheme)
- CS 232, Operating Systems and Networking
- CS 262, Software Engineering
- CS 352, Computer Graphics
- ENGR 220, Introduction to Computer Architecture (SPARC Assembly)
- MATH 161, Calculus I
- MATH 156, Discrete Mathematics for Computer Science
- MATH 256, Discrete Structures and Linear Algebra

Experience

Skills

- Java, C#, C++, PHP, CSS/XHTML, Ruby (and Rails), SQL, UML, Visual Studio 2005
- Windows Server 2003 System, Exchange Server 2003, IIS 6.0, SQL Server 2005
- Microsoft Windows Vista, Tablet PC platform, Media Center platform, Windows Mobile 5.0
- Eclipse IDE, Linux, Apache, MySQL, PostgreSQL, other open source products
- Adobe Premiere Pro 2.0, Adobe After Effects 7.0, Macromedia Fireworks 8.0



Interview Tip

- Be ready to answer questions like...
 - “How proficient are you in Perl?”
 - “What have you written using Ruby on Rails?”
 - “Have you ever administered an Exchange Server?”
- Know
 - Your Skills
 - Examples of Using Your Skills
 - Your Limitations



Experience

- Position Description
- Company
- Dates
- Bullet List of Accomplishments
 - Concise
 - Specific
 - Begin with Action Verb
 - One Line Per Bullet
 - Sentence Fragments Okay
- Only Most Relevant and Most Recent



Skills C, C++, ADA, Smalltalk, Lisp, Java, Perl, HTML, Windows 2000/XP, UNIX, Linux, Visual Studio 6.0

Experience **Software Engineering Internship** **The Boeing Company, St. Louis, MO**

- Made corrections in T-38C cockpit software Summer 2002
- Used System Integration Lab (SIL) to test changes to MDP software
- Developed ACMI debrief application for T-38C aircraft (SDT, C++, Visual Studio 6.0)
- Participated in software development processes

Software Engineering Internship **The Boeing Company, St. Louis, MO**

- Participated in SEI Level 3 Activities Summer 2001
- Developed automated testing utilities for the AHWCS project (Java, C++)
- Tested the launch control software for the *Harpoon Block II* missile
- Managed group web pages

Program Analyst Internship **Mutual of Omaha, Omaha, NE**

- Designed and implemented software (Java, some C++) Summer 2000 - Spring 2001
- Involved in a major company project
- Worked closely with associates from other companies (Trilogy, ICONIX)
- First telecommuting intern

Experience

Program Manager Intern

Microsoft Corporation

Summer 2006

Terminal Services

- Investigated solutions for a large software architecture problem
- Initiated communication with external teams for alternative solutions
- Delivered a V1 specification encapsulating the first step in the solution

System Architect and Administrator

Michigan State University

Summer 2005

College of Agriculture and Natural Resources

- Designed and implemented a major Windows Server 2003 and Exchange Server 2003 installation to handle 2,000 users
- Maintained two concurrent Active Directory forests with trusts for migration purposes
- Recovered overnight from a university-wide security issue

System Administrator

Michigan State University

Summer 2003, Spring and Summer 2004

Clara Bell Smith Center

- Designed and implemented a Windows Server 2003 and Exchange Server 2003 installation
- Converted from stand-alone desktops to fully managed desktops
- Packaged custom applications for group policy rollout

Programmer

Michigan State University

Summer 2002

Men's Basketball

- Investigated ways to use technology in the collegiate athletic environment
- Developed web service for contacting players via mobile phone
- Administered desktops with Windows XP, 2000 in a mixed Windows/Novell environment

Skills

- Java, C#, C++, PHP, CSS/XHTML, Ruby (and Rails), SQL, UML, Visual Studio 2005
- Windows Server 2003 System, Exchange Server 2003, IIS 6.0, SQL Server 2005
- Microsoft Windows Vista, Tablet PC platform, Media Center platform, Windows Mobile 5.0
- Eclipse IDE, Linux, Apache, MySQL, PostgreSQL, other open source products
- Adobe Premiere Pro 2.0, Adobe After Effects 7.0, Macromedia Fireworks 8.0



Interview Tip

- Be ready to answer questions like...
 - What kind of corrections did you make to the T38C software?
 - What's an SEI Level 3 activity?
 - What's a V1 specification?
 - What was the university-wide security issue and how did you recover?
- Know Your Summer Internships
 - Concise Description
 - Software Systems
 - Your Responsibilities
- Know Some Specific Accomplishments



Other Activities

- Including...
 - Clubs
 - Awards
 - Hobbies
 - Outside Interests
- Concise
- Avoid
 - Trivialities and/or BS
 - High School Activities and/or Awards
- Omit If None



- Experience**
- Software Engineering Internship** **The Boeing Company, St. Louis, MO**
 - Made corrections in T-38C cockpit software Summer 2002
 - Used System Integration Lab (SIL) to test changes to MDP software
 - Developed ACMI debrief application for T-38C aircraft (SDT, C++, Visual Studio 6)
 - Participated in software development processes

- Software Engineering Internship** **The Boeing Company, St. Louis, MO**
 - Participated in SEI Level 3 Activities Summer 2001
 - Developed automated testing utilities for the AHWCS project (Java, C++)
 - Tested the launch control software for the *Harpoon Block II* missile
 - Managed group web pages

- Program Analyst Internship** **Mutual of Omaha, Omaha, NE**
 - Designed and implemented software (Java, some C++) Summer 2000 - Spring 2001
 - Involved in a major company project
 - Worked closely with associates from other companies (Trilogy, ICONIX)
 - First telecommuting intern

- Hobbies**
- Licensed Private Pilot
 - Piano & Pipe Organ

System Architect and Administrator

Michigan State University

Summer 2005

College of Agriculture and Natural Resources

- Designed and implemented a major Windows Server 2003 and Exchange Server 2003 installation to handle 2,000 users
- Maintained two concurrent Active Directory forests with trusts for migration purposes
- Recovered overnight from a university-wide security issue

System Administrator

Michigan State University

Summer 2003, Spring and Summer 2004

Clara Bell Smith Center

- Designed and implemented a Windows Server 2003 and Exchange Server 2003 installation
- Converted from stand-alone desktops to fully managed desktops
- Packaged custom applications for group policy rollout

Programmer

Michigan State University

Summer 2002

Men's Basketball

- Investigated ways to use technology in the collegiate athletic environment
- Developed web service for contacting players via mobile phone
- Administered desktops with Windows XP, 2000 in a mixed Windows/Novell environment

Skills

- Java, C#, C++, PHP, CSS/XHTML, Ruby (and Rails), SQL, UML, Visual Studio 2005
- Windows Server 2003 System, Exchange Server 2003, IIS 6.0, SQL Server 2005
- Microsoft Windows Vista, Tablet PC platform, Media Center platform, Windows Mobile 5.0
- Eclipse IDE, Linux, Apache, MySQL, PostgreSQL, other open source products
- Adobe Premiere Pro 2.0, Adobe After Effects 7.0, Macromedia Fireworks 8.0

Awards

- First Place, [Memories Category](#), [Microsoft Start Something Amazing Awards](#), 2005
- Choral Honor Award, Okemos High School, Okemos, Michigan, 2004

Activities

- Calvin IMPROV, Leader
- Capella Choir of Calvin College

Good idea to include links.



Leveraging the Capstone Course

Software Engineer Intern
The Toro Company

Fall 2008
Riverside, California

- Worked on a team of four students in MSU senior capstone course.
- Designed and implemented [Golf Vision Interface for Turf Guard](#).
- Worked directly with customer to develop a complete project plan.
- Produced [video](#) about project and delivered software product.
- Awarded the [TechSmith Screencast Award](#).

Good idea to include links.



Interview Tip

- Be ready to answer questions like...
 - “So, what do you do for fun?”
 - “What do you do when you’re not working?”
 - “Do you have any hobbies?”
 - “What’s ACM?”
 - “What did you do accomplish as president of WIC?”



Bonus Resume Tip

- Learn how to use Microsoft Word!
 - Use Paragraph Spacing
 - Do use paragraph spacing between lines.
 - Do not use empty lines, i.e., just hit return.
 - Use Styles
 - Use Tabs
 - To Line Up Things
 - Do not use spaces, which won't work anyway.
 - Use Right Justified Tabs
 - To Justify Things on the Right Margin
 - Do not use tabs and/or space, which won't work anyway.
 - Etc...
- Submit PDF, Not Word Source
- Test Print Resume (on Paper)



Bonus Resume Tip

- Single Page Limit

But...

- Multiple Versions Possible

- Target For Particular

- Industry
- Company

- Vary

- Lists of Courses
- Lists of Course Projects
- Bullet Points Describing Experiences/Internships



Resume Writing and Interviewing

✓ Resume Writing

➤ Interviewing



Clean Up Your Web Presence

- Facebook
- Twitter
- Personal Web Pages
- Flickr
- Etc...

HR people will and do check these things out.

What about your 1st Amendment rights?



Due Diligence

- Research the company.
- Research the interview.
 - Talk with others who have been interviewed.
 - Ask “What style of interview should I expect?”
- Research the interviewers.
 - Get an interview schedule with names and titles.
 - Figure out who does what.
 - Google for interviewer interests and hobbies.
- Research the dress code.
 - Ask recruiter/interviewer.
 - Ask others.
- Do not be surprised.

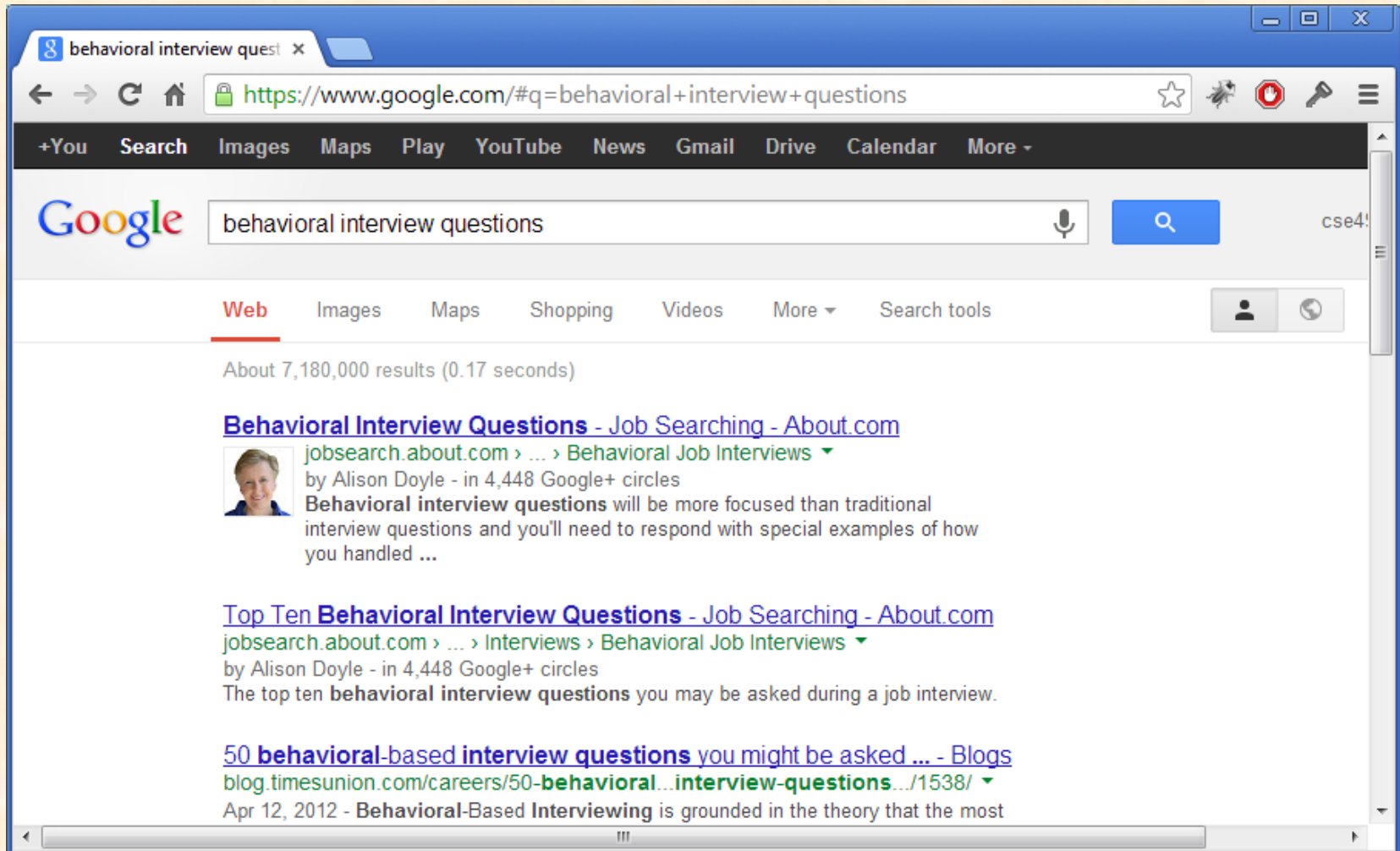


Interview Styles

- Many & Varied
 - Technical (How does IPv6 differ from IPv4?)
 - Problem-Solving (In the adjacent room are three lights...)
 - Behavioral (Tell me about a time when...)
 - Coding (Write a recursive function that...)
 - Etc...
- Research
 - Types of Interview
 - Questions for Each Type
 - Type to Be Used
- Do not be surprised.



Google behavioral interview questions



The screenshot shows a Google search results page for the query "behavioral interview questions". The search bar contains the text "behavioral interview questions" and a blue search button. Below the search bar, the "Web" tab is selected, showing approximately 7,180,000 results in 0.17 seconds. The top three search results are:

- Behavioral Interview Questions - Job Searching - About.com**
jobsearch.about.com > ... > Behavioral Job Interviews
by Alison Doyle - in 4,448 Google+ circles
Behavioral interview questions will be more focused than traditional interview questions and you'll need to respond with special examples of how you handled ...
- Top Ten Behavioral Interview Questions - Job Searching - About.com**
jobsearch.about.com > ... > Interviews > Behavioral Job Interviews
by Alison Doyle - in 4,448 Google+ circles
The top ten behavioral interview questions you may be asked during a job interview.
- 50 behavioral-based interview questions you might be asked ... - Blogs**
blog.timesunion.com/careers/50-behavioral...interview-questions.../1538/
Apr 12, 2012 - Behavioral-Based Interviewing is grounded in the theory that the most

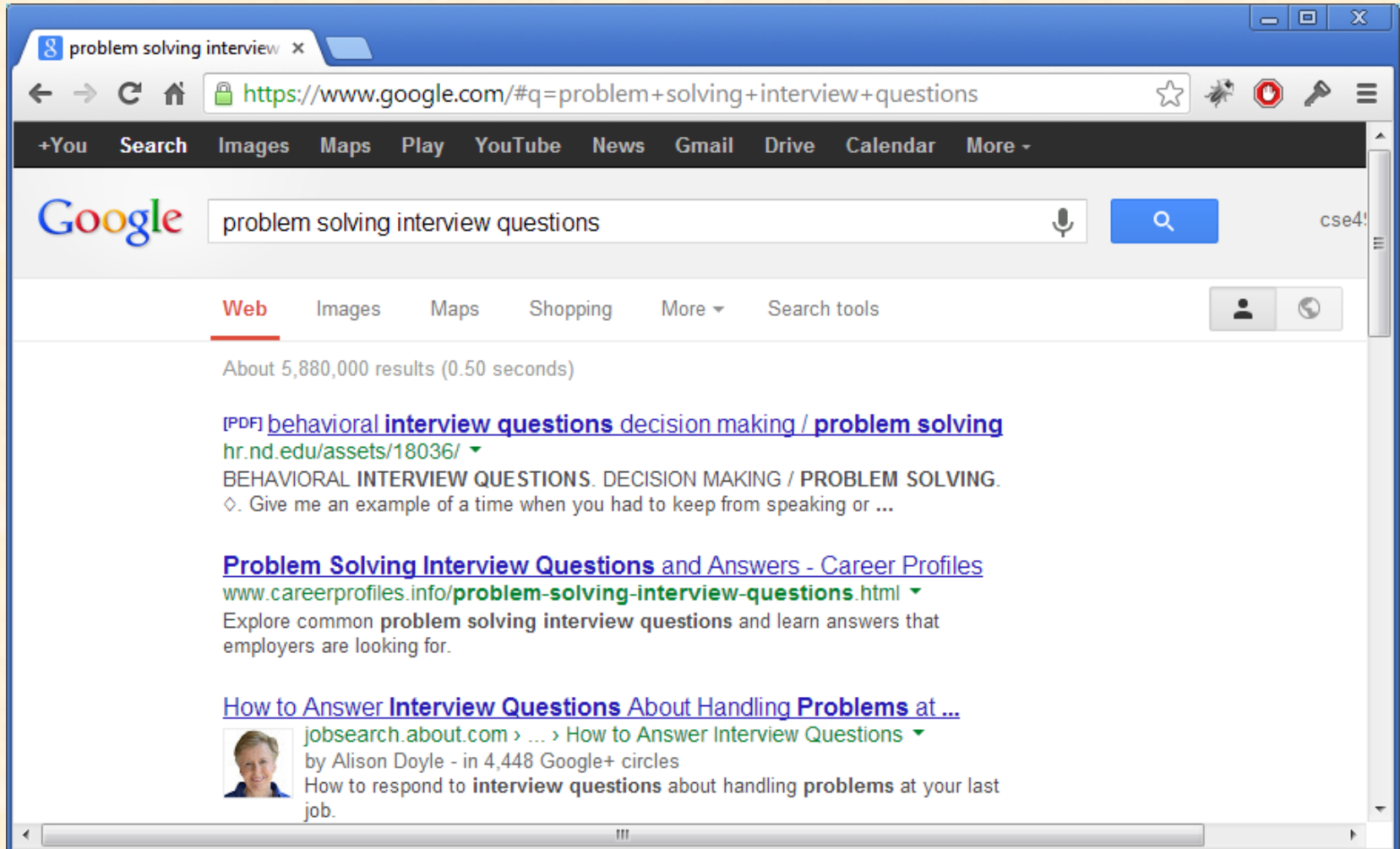


Behavioral Interview Questions

1. Describe a situation in which you were able to use persuasion to successfully convince someone to see things your way.
2. Describe a time when you were faced with a stressful situation that demonstrated your coping skills.
3. Give me a specific example of a time when you used good judgment and logic in solving a problem.
4. Give me an example of a time when you set a goal and were able to meet or achieve it.
5. Tell me about a time when you had to use your presentation skills to influence someone's opinion.
6. Give me a specific example of a time when you had to conform to a policy with which you did not agree.
7. Please discuss an important written document you were required to complete.
8. Tell me about a time when you had to go above and beyond the call of duty in order to get a job done.
9. Tell me about a time when you had too many things to do and you were required to prioritize your tasks.
10. Give me an example of a time when you had to make a split second decision.
11. What is your typical way of dealing with conflict? Give me an example.
12. Tell me about a time you were able to successfully deal with another person even when that individual may not have personally liked you (or vice versa).



Google problem-solving interview questions



Problem Solving: Riddles

- Why is a manhole cover round?
- How many cars are there in the USA?
(A popular variant is "How many gas stations are there in the USA?")
- How many manhole covers are there in the USA?
- You've got someone working for you for seven days and a gold bar to pay them. The gold bar is segmented into seven connected pieces. You must give them a piece of gold at the end of every day. If you are only allowed to make two breaks in the gold bar, how do you pay your worker?
- One train leaves Los Angeles at 15mph heading for New York. Another train leaves from New York at 20mph heading for Los Angeles on the same track. If a bird, flying at 25mph, leaves from Los Angeles at the same time as the train and flies back and forth between the two trains until they collide, how far will the bird have traveled?
- Imagine a disk spinning like a record player turn table. Half of the disk is black and the other is white. Assume you have an unlimited number of color sensors. How many sensors would you have to place around the disk to determine the direction the disk is spinning? Where would they be placed?
- Imagine an analog clock set to 12 o'clock. Note that the hour and minute hands overlap. How many times each day do both the hour and minute hands overlap? How would you determine the exact times of the day that this occurs?
- You have two jars, 50 red marbles and 50 blue marbles. A jar will be picked at random, and then a marble will be picked from the jar. Placing all of the marbles in the jars, how can you maximize the chances of a red marble being picked? What are the exact odds of getting a red marble using your scheme?



Problem Solving: Algorithms

- What's the difference between a linked list and an array?
- Implement a linked list. Why did you pick the method you did?
- Implement an algorithm to sort a linked list. Why did you pick the method you did? Now do it in $O(n)$ time.
- Describe advantages and disadvantages of the various stock sorting algorithms.
- Implement an algorithm to reverse a linked list. Now do it without recursion.
- Implement an algorithm to insert a node into a circular linked list without traversing it.
- Implement an algorithm to sort an array. Why did you pick the method you did?
- Implement an algorithm to do wild card string matching.
- Implement `strstr()` (or some other string library function).
- Reverse a string. Optimize for speed. Optimize for space.
- Reverse the words in a sentence, i.e. "My name is Chris" becomes "Chris is name My." Optimize for speed. Optimize for space.



Problem Solving: Applications

- How can computer technology be integrated in an elevator system for a hundred story office building? How do you optimize for availability? How would variation of traffic over a typical work week or floor or time of day affect this?
- How would you implement copy-protection on a control which can be embedded in a document and duplicated readily via the Internet?
- Define a user interface for indenting selected text in a Word document. Consider selections ranging from a single sentence up through selections of several pages. Consider selections not currently visible or only partially visible. What are the states of the new UI controls? How will the user know what the controls are for and when to use them?
- How would you redesign an ATM?
- Suppose we wanted to run a microwave oven from the computer. What kind of software would you write to do this?
- What is the difference between an Ethernet Address and an IP address?
- How would you design a coffee-machine for an automobile.
- If you could add any feature to Microsoft Word, what would it be?
- How would you go about building a keyboard for 1-handed users?
- How would you build an alarm clock for deaf people?

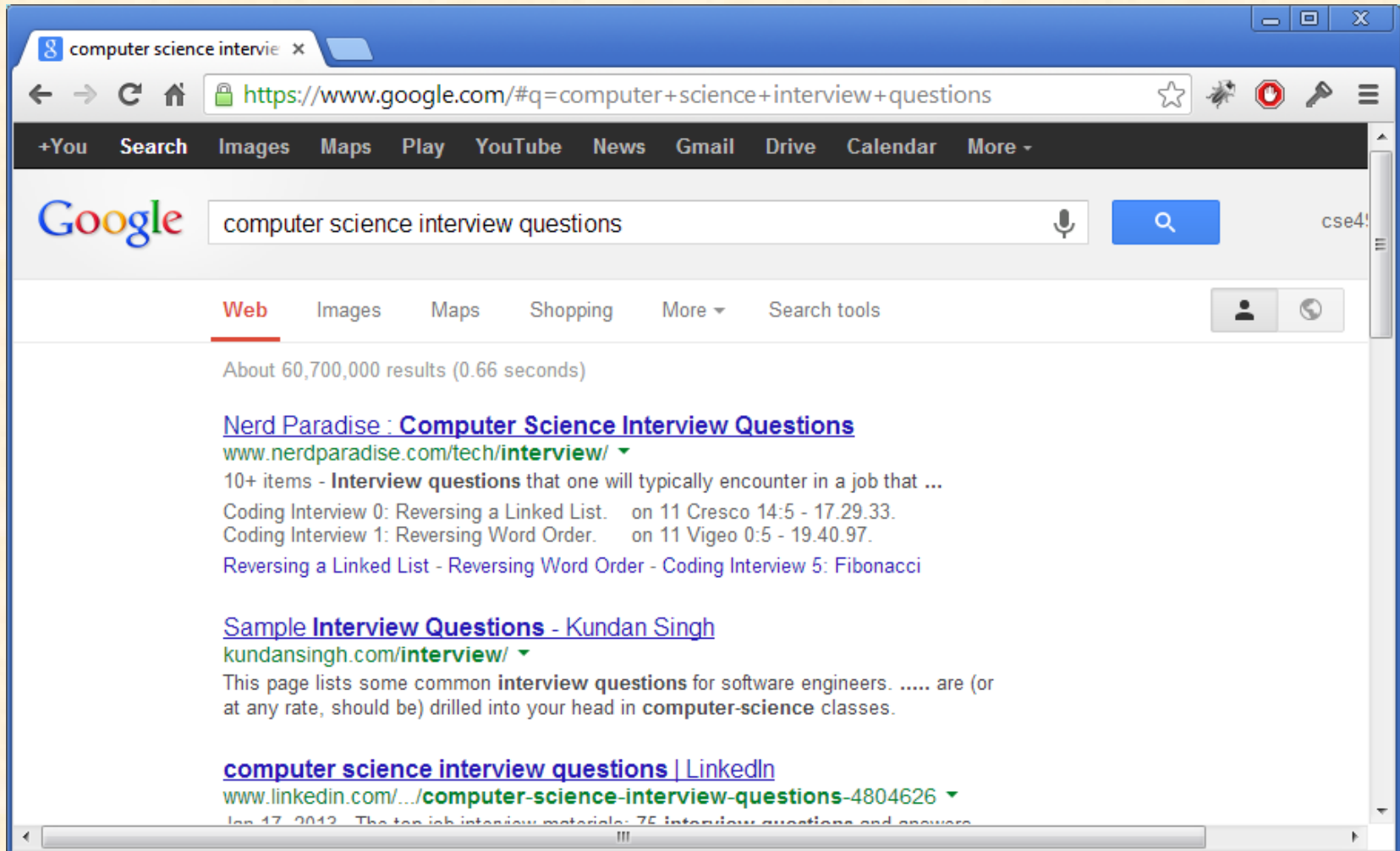


Problem Solving: Thinkers

- How are M&Ms made?
- If you had a clock with lots of moving mechanical parts, you took it apart piece by piece without keeping track of the method of how it was disassembled, then you put it back together and discovered that 3 important parts were not included; how would you go about reassembling the clock?
- If you had to learn a new computer language, how would you go about doing it?
- You have been assigned to design a bathroom for Bill Gates. Naturally, cost is not a consideration. You may not speak to Bill.
- What was the hardest question asked of you so far today?
- If MS told you we were willing to invest \$5 million in a start up of your choice, what business would you start? Why?
- If you could gather all of the computer manufacturers in the world together into one room and then tell them one thing that they would be compelled to do, what would it be?
- Explain a scenario for testing a salt shaker.



Google computer science interview questions



What's the point?

Will you get these exact questions?

- You Might
- But Probably Not
- So, what's the point?



Look the Part

(1 of 2)

- People do judge books by their covers.
- Research the “look”.
- If you want the “part”, “look” the “part”.
- Appearance
 - Clothes
 - Shoes
 - Hair (Style, Length, Colors, ...)
 - Body Piercings
 - Etc...



Look the Part

(2 of 2)

- Get Advice From Someone With Taste
 - Styles in General
 - What Looks Good on You
 - Size and Fit
 - Whole Package
 - Clothes
 - Shoes
 - Jewelry
 - Hair
 - Etc...
- Do due diligence.
- Expectations for interviewee may be very different than for interviewer or employee.



Your Personal Presence

- Introduce Yourself
- Learn How to Shake Hands
- Avoid Nervous Habits
- Make Eye Contact (But Don't Stare Down)
- Give “Right Length” Answers
 - Long Enough
 - Not Too Long
- If Necessary
 - Repeat Question to Buy Time
 - Ask for Clarification
- Practice Wearing Interview Attire



The First Question

- What's the first question at many interviews?
- Tell me/us about yourself.
- Be Ready
- Practice Answer
- Avoid
 - Too Short
 - Too Long
 - Too Vague
 - Too Detailed



Bad Comments to Make

...During the Interview

- “I see you just lost that big contract to Acme.”
- “Wow, your stock price really took a hit yesterday.”
- “It sure looks like the cost of living is high here.”
- “I hear a lot of complaints about Windows 8.”
- “I didn’t do well in that course because the professor sucked.”
- “I didn’t do well in that course because I wasn’t interested in it.”
- Etc...



Bad Questions to Ask...

...During the Initial Interview

- “How much will I make?”
- “How much vacation will I get?”
- “Is there dental coverage?”
- “Will you pay moving expenses?”
- “Will I get my own office?”
- “How soon will I be promoted?”
- “Can you tell me what your company does?”
- “Will I have to work more than 40 hours per week?”
- Etc...

(What if they ask you “How much do you expect to make?”)



Good Comments to Make..

...During the Interview

- “That T-38 looks like a really cool plane.”
- “The 787 looks amazing. Passengers will really like the large structure bearing windows.”
- “Alan Mulally was a great hire.”
- “I’m running Windows 8 and it’s great.”
- “I’m running Exchange Server out of my apartment.”



The Last Question

- What's the last question at many interviews?
- Do you have any questions for me/us?
- What's a really bad answer?
- What are some good answers?



Good Questions to Ask...

...During the Interview

- “Are there opportunities for professional development?”
- “Is there support for advanced degrees?”
- “What career paths are available?”

Okay Questions to Ask...

- “What’s the corporate culture like?”
- “What’s a typical week like?”



Things Not to Do

- Don't complain about anything like...
 - ...your trip
 - ...the airline
 - ...the hotel
 - ...the weather
 - ...the interview process
 - ...other interviewers
 - ...other companies
 - ...etc...
- Don't discuss politics or religion.
- Don't drink alcohol (ever, never, not at all).
- Etc...



Business Cards

- Be ready to handout your business card.
 - Use MSU email account.
 - Include personal URL with link to resume (downloadable).



Follow-Up

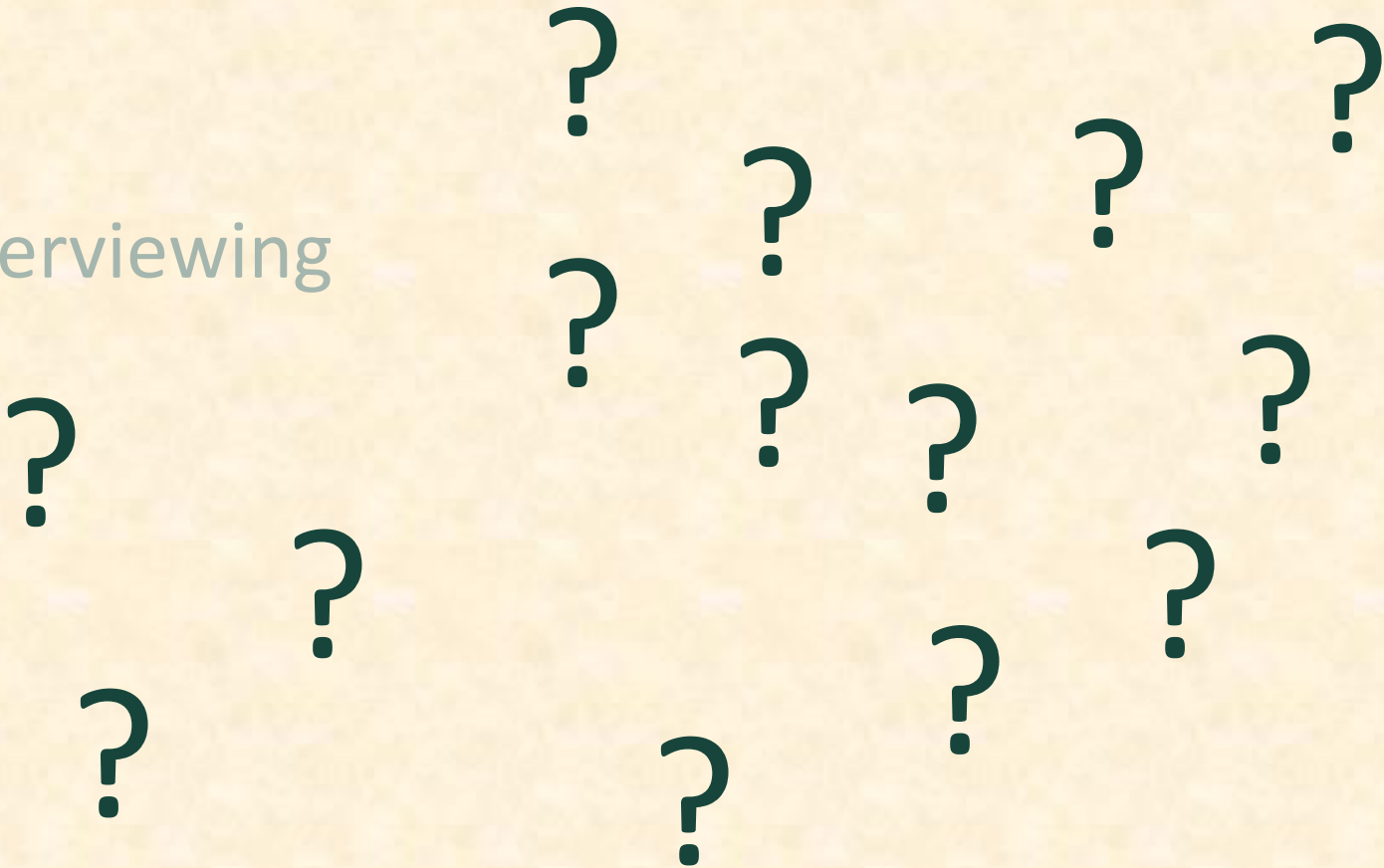
- ASAP
- Hand-Written Note
 - US Mail
(Get Business Cards for Address)
 - Buy Nice MSU Note Cards
- Try to Include Brief Personal Comment
 - Related to Interviewer
 - Record Info on Back of Business Card ASAP



Resume Writing and Interviewing

✓ Resume Writing

➤ Interviewing



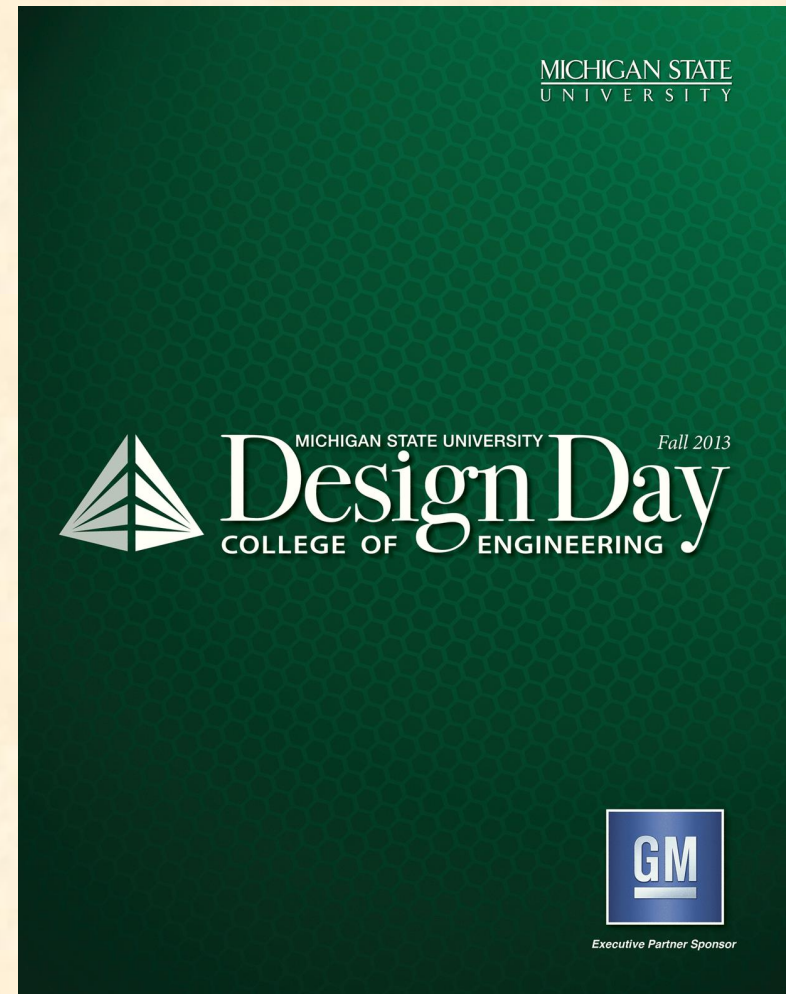
What's ahead?

- All-Hands Meetings
 - ~~M, 02/10: Resume Writing and Interviews~~
 - W, 02/12: Creating and Giving Presentations
 - M, 02/17: Alpha Presentations
 - W, 02/19: Alpha Presentations
 - M, 02/24: Alpha Presentations
 - W, 02/26: Alpha Presentations
 - M, 03/03: Spring Break
 - W, 03/05: Spring Break
- Alpha Presentations Conflicts
 - Only for Documentable/Non-Movable Interview
 - Send Email to Dr. D.
- Design Day Booklet Content
 - Templates Sent Later Today
 - Copy and Artwork Due By Friday, 02/14



Design Day Booklet

- Professional Publication
 - Corporate Relations
 - Alumni Relations
 - Recruiting
 - Keepsake for You
- Contents
 - Schedule of Events
 - Project Descriptions



Project Description Page

- Template Distributed by Dr. D.
 - Sponsor Name
 - Sponsor Logo
 - Project Title
 - MSU Team Photo
 - MSU Team Members' Names
 - Corporate Sponsors' Names
 - Headers and Footers
- Template Complete by Team
 - Project Description
 - Artwork



Team's Job

- READ Instructions Carefully
- Check Everything
- READ Instructions Carefully
- Write Project Description
- READ Instructions Carefully
- Provide Artwork
- READ Instructions Carefully
- READ Instructions Carefully



Ford Motor Company Mobile Approver

Insert your project description here. Target your writing for the general public. Begin with the motivation for your project. Do not begin with phrases like “Our project was to make...” or “For our project we made...”. See the example that Dr. D. wrote for [Spartan Basketball Player Timer](#).

Use a “newspaper” style of writing. Sentences and paragraphs should tend to be short and snappy. It’s even okay to have a paragraph with only one sentence, just not too many of them. Write everything in the present tense.

If space permits, you can reference your artwork at the right.

Use 11-point, Times New Roman font. Use single space lines. Justify both margins. Use 6 pts of space between paragraphs; do not use blank lines between paragraphs. Use one space between sentences within a paragraph.

The size of this textbox is 4.1” (wide) by 5.25” (high). Do not change the size of the textbox. Your text must fit exactly within this textbox with these dimensions. This means that your text should fill the entire textbox but no more.

The last line of each paragraph should be at least one-half to three-quarters of the width of the textbox. Do not end a paragraph with a line containing one or two words.

After you have a draft, make the template available to your clients. Get feedback from them before you sub.

The last two lines or so should include technical information about your project. See [previous Design Day booklets](#) and [Spartan Basketball Player Timer](#) for examples.

Insert at least one piece of artwork here.

Artwork should be a screen shot or screen shots of your software.

Artwork must be large enough to be viewable.

If artwork is a web app, include a browser frame.

If artwork is a mobile app, include mobile device frame.

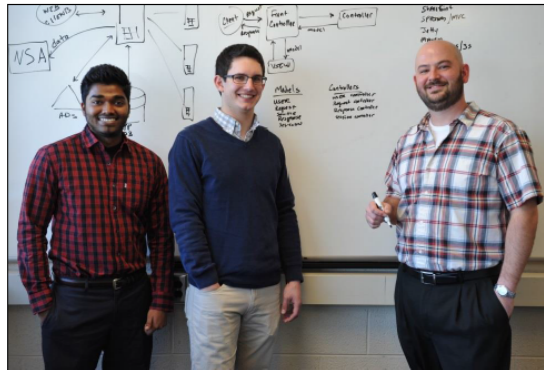
If artwork is a native app, include native window frame.

Artwork must fit in this textbox.

This textbox is 3.75” wide.

You should fill this space as much as possible.

You may increase the height of the textbox if there is sufficient space above your corporate logo (below) without having to shrink the size of your corporate logo.



Michigan State University

Team Members (left to right)

Nik Andrews
Troy, Michigan

Anthony Russel
Wixom, Michigan

Tony Cooke
Lansing, Michigan

Ford

Project Sponsors

Adam Haas
Dearborn, Michigan

Randy Nunez
Dearborn, Michigan

Michael Platt
Dearborn, Michigan

Michael Seneski
Dearborn, Michigan

Michael Volk
Dearborn, Michigan

Project Description

- Newspaper / Magazine Style
- Target General Public
- Do NOT Start “Our Project is...”
- Use Present Tense Throughout
- Fill the Textbox
- At Most Two or Three Lines of Technical Jargon
- Read Examples from Previous Books
(Design Day > Booklet)
- READ Instructions Carefully



Artwork

- Screenshot(s) of Working Software
- Include “Framing”
 - Browser
 - iPhone, iPad
 - Android
- Very High Resolution
- Preserve Aspect Ratios
- Can Overlap
- See Examples from Previous Books
(Design Day > Booklet)
- READ Instructions Carefully



MSU Federal Credit Union Smart Start Savers

Michigan State University Federal Credit Union (MSUFCU) was founded in 1937 in East Lansing, Michigan. MSUFCU is an important member of the Michigan State University community and is currently the largest university-based credit union in the world, serving more than 175,000 members.

MSUFCU recognizes the importance of teaching our youth the value of being financially responsible. Our Smart Start Savers app is an iPad application that provides local elementary and middle school students with the ability to do banking at MSUFCU micro-branches during the school day.

Once a school is enrolled in the Smart Start Savers program, parent volunteers are able to use our iPad app to set up MSUFCU micro-branches within the school to accept and review student deposits.

Students bring the cash they wish to deposit to the parent volunteer who then uses our app to locate the student's account and record their deposit. Our app sends a receipt to each student's parent or guardian.

When the in-school banking hours are over, our app creates a daily summary so that the parent volunteer can reconcile the day's deposits. The parent volunteer takes the money to a local MSUFCU branch to be processed by MSUFCU associates.

This Smart Start Savers program is designed for initial use by MSUFCU's Oakland University Credit Union brand.

Our app runs on an iPad 2 or newer running at least iOS 6. It is written in Objective-C and interfaces with a PHP API to access the MySQL database.



Michigan State University
Team Members (left to right)

Allen Koppman
Hazel Park, Michigan

Phil Getzen
Lowell, Michigan

Maïrin Chesney
Brighton, Michigan

Adam Proschek
Royal Oak, Michigan

MSUFCU
Project Sponsors

Samantha Amburgey
East Lansing, Michigan

Sarah Bohan
East Lansing, Michigan

April Clobes
East Lansing, Michigan

Ben Maxim
East Lansing, Michigan

Christina Minnis
East Lansing, Michigan

Quicken Loans Survey and Voting Web Apps

Quicken Loans is the nation's largest online mortgage lender and is headquartered in Detroit, Michigan. The company has closed nearly two million home loans since being founded in 1985.

Quicken Loans uses electronic survey and voting tools to collect feedback from their team members. Feedback may be gathered over the course of days with a survey or instantly by voting at meetings.

Currently, Quicken Loans uses third-party survey and voting tools. Use of these third-party tools is cumbersome and results often fail to meet the needs of Quicken Loans.

Designed in collaboration with our clients from Quicken Loans, our Survey and Voting Web Apps provide survey and voting tools that are completely internal to Quicken Loans.

Using our web apps, team members create surveys and voting ballots, take surveys and vote, and review survey and voting results. Surveying and voting can be done anonymously and restricted using Geo-Fencing. Results can be exported to Excel spreadsheets.

Our Survey and Vote Web Apps supports all modern desktop web browsers as well as many mobile devices.

Our application uses a Model-View-Controller architecture with the Microsoft Entity Framework along with JQuery and JavaScript. Microsoft SQL Server is used to store surveys, voting ballots and results.



Quicken Loans
Engineered to Amaze

CSE 498 Engineering Building, Room 3405 | Third Floor 10:25 a.m.

Spectrum Health System Talent Connections Careers Mobile Site

Spectrum Health System, headquartered in Grand Rapids, Michigan, provides high quality, high value healthcare in West Michigan through its nine hospitals, which are staffed by over 20,000 employees.

In order to maintain and grow its workforce, Spectrum Health hosts online job search and application systems.

Our Talent Connections Careers Mobile Site is a new easy-to-use mobile job application system that provides a way for on-the-go users to apply quickly and easily for jobs at Spectrum Health. Our system supports both smart phones and tablets.

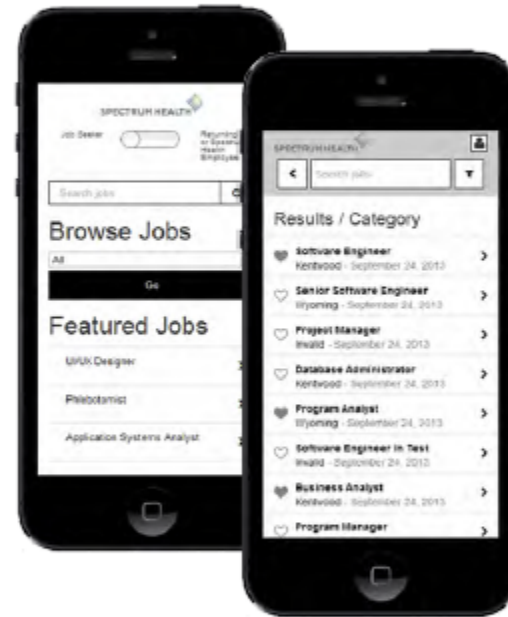
When a user expresses interest in applying for a position, they are directed to the search page shown at the right. Available jobs can be filtered by numerous criteria or sorted either alphabetically or by the date they were posted.

Search results include basic information about each job, including a position title and location. Tapping on a job search result gives more details along with an option to apply.

Our mobile web site uses a responsive layout, which enables it to accommodate the great variety of differing mobile device screen sizes automatically and dynamically.

Since many mobile phones and tablets do not allow users to store documents on them, our Talent Connections Careers Mobile Site is integrated with DropBox so users can submit their résumés by logging into their DropBox account.

Our single-page web app employs state-of-the-art technologies including HTML5, CSS3, AngularJS and Bootstrap.



SPECTRUM HEALTH 

Urban Science Dealership Consultant Mobile App

Urban Science is a business-solutions company focused on supporting the sales and marketing needs of the automotive industry. They leverage a scientific methodology to help their client partners sell more vehicles, improve profitability, and increase customer loyalty.

Urban Science consultants work with individual dealerships to improve their performance. Consultants collect and analyze dealership specific data along with regional data. Using this information, consultants travel to dealerships and meet with their clients to review performance data and make recommendations for improvements.

Working with Urban Science, we have developed a mobile app for use by consultants before, during and after meetings with dealerships called Dealership Assistant.

Our app provides consultants with instant and easy access to all of the dealership performance data during their client meetings. Graphs and charts provide helpful visualizations of the data to identify areas needing improvement.

Consultants then use our app to record the results of the meeting along with agreed upon action items for the dealership, which are then uploaded to a central database for further analysis by Urban Science.

Our Dealership Consultant Mobile App supports both iPads and Android tablets.

Our software is written in XCode and Java. SQL is used for the back-end database.



URBAN SCIENCE

TechSmith Learning Activity Capture

Based in Okemos, Michigan, TechSmith provides over 180 countries around the world with screen capture and recording software, which is widely used in educational settings for computer-based learning activities.

Our Learning Activity Capture software captures users' computer-based learning activities by tracking and organizing these activities, and making them available to users online.

Our software is comprised of three distinct parts: a Google Chrome extension, a Microsoft Windows application and the TechSmith Smart Player. All three create and record statements that describe a user's learning experience. Users can view an organized summary of their learning activities on their individualized "Record Store" web page.

The Chrome extension is a browser button that, when pressed, sends statements about visited websites as a learning activity. Typical statements are "Ben read a Wikipedia article" or "Brett watched a YouTube video."

Unlike the Chrome extension, the Windows application sends statements automatically by monitoring when certain programs or files are opened and determining the appropriate time to record these events as learning activities.

The TechSmith Smart Player is a web application that presents interactive video quizzes and sends these quiz results as learning activity statements.

The user applications are written in JavaScript and C#, the web pages are served through Django, and the back-end is supported by a PostgreSQL database.

