CAREERS IN
COMPUTER
ENGINEERING

Bruce Jacob

University of
Maryland

Career Paths in Computer Engineering

Bruce Jacob

Electrical & Computer Engineering

University of Maryland, College Park

WHAT ARE YOU
GOING TO DO
WITH YOUR
LIFE?

Bruce Jacob

University of
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So What Are You Going to Do With Your Life?

Bruce Jacob

Electrical & Computer Engineering
University of Maryland, College Park

UNIVERSITY OF MARYLAND

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The Scene

OPEN CURTAIN: *Engineer* -- **talented, motivated, hard-working, comfortable with the college thing, is accosted by *Parents*, *D* and *M***

D: Hey — we know it's only Junior Year, but have you got the rest of your life planned out yet?

M: By the way, we're very proud of the grades and all, but — again — about your life ...

Engineer: Aaaaaaaaaaaaaaaaaaaaaaaaaaagh!

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Careers in Engineering

YOUR OPTIONS:

College => Industry

=> Grad School   => Industry

=> Research

=> Academics

PATHS I WILL DISCUSS:

- *Industry*   *B.S. or M.S.* *******

- *Industry/Research*   *Ph.D.*

- *Academics*   *Ph.D.* *******

*** Paths I have taken

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Big Picture

In Computer (& Electrical) Engineering:

- **Industry**   **BS/MS**   **DEVELOP**

- **Industry/Research** **PhD**   **DESIGN**

- **Academics**   **PhD**   **RESEARCH**
                                        TEACH

DEVELOP == BUILD
DESIGN == JUSTIFY YOUR CHOICES

PhD's are paid to THINK

MS's & BS's are paid to DO *

*** Mitigated by SIZE of COMPANY

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Big Picture

	Industry/BS	Industry/PhD	Academia
Salary Range (0yrs - 10yrs)	$50K - 100K	$80K - 120K	$70K - 120K (12-month)
Job Security	OKAY	GOOD	GREAT
Freedom	LITTLE	SOME	LOTS
Respect	LOTS	LOTS	LITTLE
Visibility	NONE	LITTLE	LOTS
Brief Job Description	DEVELOP	DESIGN	RESEARCH & TEACH
Perks of the Position	FREE COFFEE	STOCK OPTIONS	TALKING TO A CAPTIVE AUDIENCE :)

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Industry — BS/MS

JOB DESCRIPTION:

- *Optimize Previous Designs*

- *Debug Existing Designs*

- *Technical Support*

- *Site Maintenance*

- *Sales Engineering*

- *The "D" of "R&D"*

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Industry — BS/MS

A DAY IN THE LIFE:

- *Programming (product development)****

- *Testing/Debugging*

- *Meetings (scheduling)*

- *Travel to customer sites*

- *Interacting with customers*

*** C, Java, Verilog, VHDL, SPICE, Cadence, etc ... depends on project

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Industry — PhD

JOB DESCRIPTION:

- ***Design Next-Generation Product***

- ***Design/Develop Highly Complex Products (e.g. CAD tools)***

- ***Long-Range Planning***

- ***Concept Development***

- ***The "R" of "R&D"***

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Industry — PhD

A DAY IN THE LIFE:

- *Programming (experimental)****

- *Meetings (brainstorming)*

- *Writing papers — maybe*

- *Travel to conferences*

*** C, Java, Verilog, VHDL, SPICE, Cadence, etc ... depends on project

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Academics — PhD

JOB DESCRIPTION:

- *Research: Whatever you want (given funding constraints)*

- *Teaching: Whatever is needed*

- *Mentoring students*

TWO UNIVERSITY MODELS:

- *Teaching Universities*

- *Research Universities*

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Academics — PhD

A DAY IN THE LIFE:

- *Writing **proposals**, papers & talks*

- *Email*

- *Programming (experimental)****

- *Develop & teach courses*

- *Travel to conferences*

***** C, Java, Verilog, VHDL, SPICE,
Cadence, etc ... depends on project**

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Start-Up Companies ***

- **Enter at Any Level**

- **Flexible Job Description**
(room to move around)

- **Flexible Pay Scales**
(SMALL possibility of LARGE pay-offs)

- **Collegiate Atmosphere**
(working day == noon to 3am, etc.)

- **A Downside: RISK FACTOR**
(not advised for those w/ mortgage, kids, etc. — mitigated by size & age of the start-up)

*** Includes grant-funded "mercenaries"

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Start-Up Companies

	Start-Up Company
Salary Range	**$40K - 100K or more**
Job Security	**NONE (... to LOTS)**
Freedom	**LOTS**
Respect	**LOTS**
Visibility	**NONE**
Brief Job Description	**DESIGN, BUILD, TEST, MAINTAIN, WHATEVER ...**
Perks of the Position	**COOL ATMOSPHERE, INTRIGUING PROBLEMS, STOCK OPTIONS (maybe)**

Perhaps Best of Both Worlds?

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Important Note on Timing

MY PATH:

**1988 Graduated College, Started 1st Job
       (as High-School Math Teacher)**

1989 Joined One Start-Up (Empl. #65)

1990 ...

1991 Joined Another Start-Up (Empl. #2)

1992 Entered Grad School

1993 ...

1994 ...

1995 ...

1996 ...

1997 Joined Faculty at Maryland

POINT: Never too late to change your mind

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Reiteration/Conclusion

You do NOT have to figure it out NOW

Where you are 10 years from now != where you THINK you will be 10 years from now

**No decisions are binding
(can always change paths)**

STAY CURRENT IN FIELD ... makes changing directions easy

Enjoy yourself

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Question & Answer

EXAMPLES:

- *What is grad school like?*

- *Start-up vs. academia?*

- *MS vs. BS -- is there no difference?*

- *Sorry -- I was sleeping --* mercenaries*?*

- *What was that you said about <u>jobs</u>?*

More Info -- http://www.ece.umd.edu/~blj

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