A Software Engineer's Career

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Agenda

- Mine (maybe your) career path

- A day in software engineers' life

- AI is your companion (or Foe)

My Journey

- "You may cover a lot of ground to get somewhere" – Murat AD 2025

- Bursa (2004) Ankara (2008), Cleveland (2012), NY (2014), Paris (2016), Ithaca (2022), Seattle (2024), Williamstown (never?)

What's Expected from Software Engineers – In years

- Fresh out of college (2 years): Learning a ton of new techniques/languages, not that much design, mostly coding/testing, you get a lot help

- Junior (2-4): Some expectation around project management, set deliverables, you get help, start talking to stake holders (customers)

- Senior (4-10): Full autonomy, complex design work, master of a domain, mentors others

- Principal (10+): Across organization impact, patents or novel ideas

What Changes in Years and What Stays the Same

- Languages
  - Started with C, C++, mostly working with C#
- Technological Stacks
  - Desktop apps, Web/Mobile, Cloud, AI in cloud?
- Learning
  - Via books, tutorials/videos, copilot (ChatGPT)
- Customers
  - There is always a reason why some code is being written
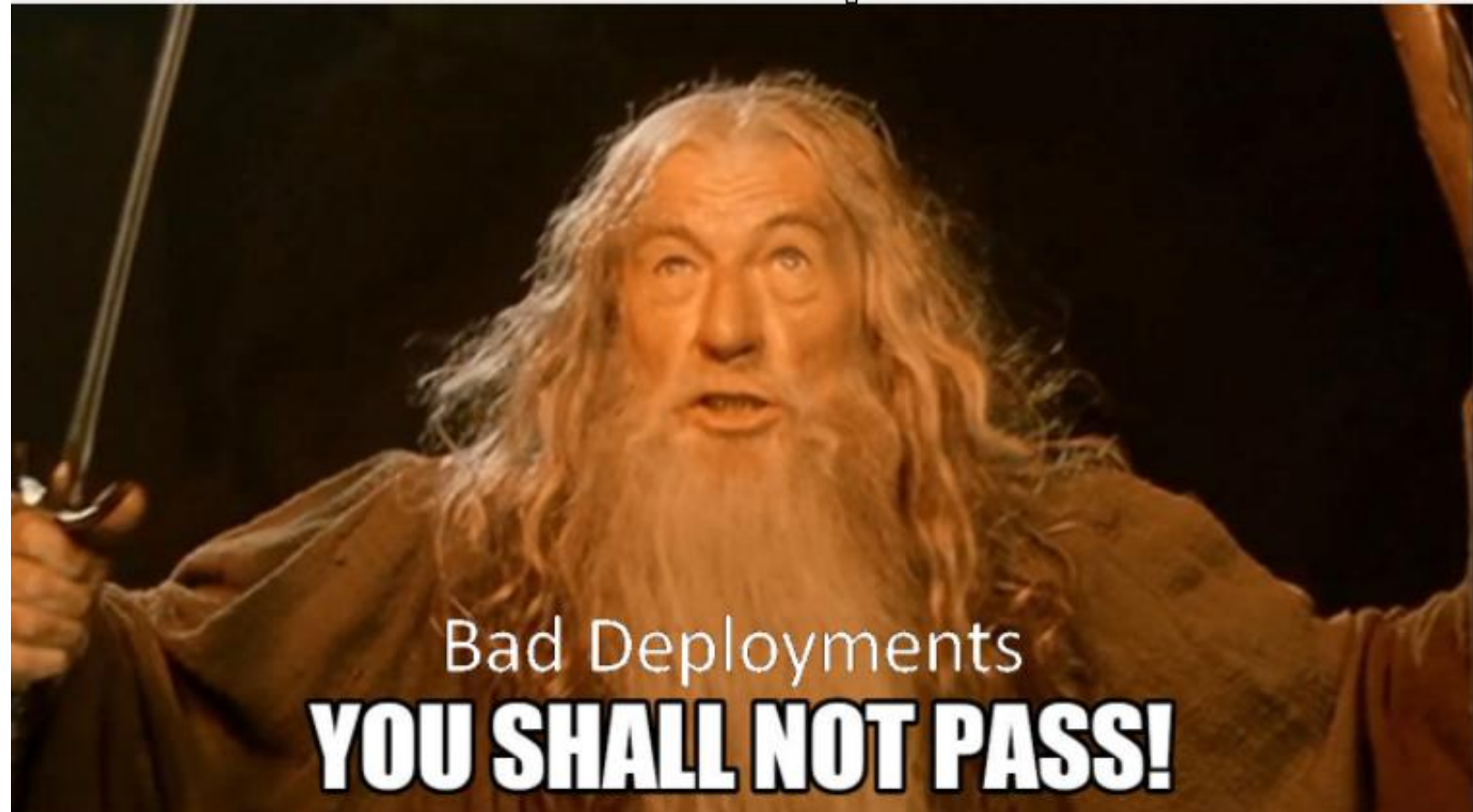 - Fields I had to learn: Finance, Bottling business, Deployment Safety

Burnout

- Having too much fun?
- Self-care
- South America trip

Day in Software Engineers Life

Ok, but what do you do? Really?

Bad Deployments
YOU SHALL NOT PASS!

What if they do?

- Outages!
- Example of critical systems runs on cloud
  - Hospitals
  - Emergency response systems
  - Energy grids
  - Financial systems
  - Streaming services (semi-critical)
  - Gaming (very-critical)

Are you alone in this?

- Nope!
- Team sizes around 10-15
- Sub-team around 4
- Org size is in the order of thousand
- Azure org size is many thousands

Communication is the key!

- You will write docs!

- Present ideas

- Convince others

- Make friends and build collaborations

- Being humble, curious and helpful always wins!

How to stay up to date?

- A genuine passion for the field

- Always look under the cover

- You will have an amazing base

  - Audited CSCI 381 - Deep Learning in fall
  - Auditing CSCI 374 - Machine Learning

Why is it important to stay up to date?

- No technological wave can surprise you
- Gives you a competitive edge
- It is fun to know what you are talking about, especially when there is crisis

My fav data structures

- HashMap (Dictionaries)
  - Look ups make things much faster! Faster is good.
- Queues
  - You can't always process what you want! But if you queue sometimes, you process what you can! – Rolling Stones? (in an alternative universe)
- List
  - Using all the time! In multi-step data processing
- Trees
  - When there is hierarchical info, there will be a tree.
- Graphs
  - When relationships get complicated, graphs will come and save you

AI – Love it or hate it, it is here

- What does it do today at work?
  - What you see with Word/Excel/Powerpoint
    - Coaching mode is very useful for improving writing skills
  - All the functionality in GitHub Copilot
    - Writes my tests
    - Explains code
    - In C#, it is not great at debugging but getting better
- Besides work?
  - Thought me some Python for Mark's class

AI – Missing Pieces

- What it cannot do today

  - Any complex design
    - Have seen a three page prompt trying to guide 'ground' AI for design
  - Maintaining large code bases
  - Running things in production, writing the code is just the beginning

AI – Why I am Auditing Classes

- It is always very important to know how things work under the cover

- What if you don't want to be just users of these technologies

- There are many emerging problems with AI that someone needs to solve (AI cannot)

  - Auditability/Explainability
  - Safe-guards
  - The Coming Wave – Mustafa Suleyman is a great read on these

Selfish plug

- We want you!

- There are internship opportunities!

Thank you