



Distributed and Operating Systems (DOS)

Prof. Dr. Odej Kao



Welcome to DOS



Prof. Dr. Odej Kao
Head of DOS

Dear students, it is our pleasure to warmly welcome you at our research group on Distributed and Operating Systems (DOS)!

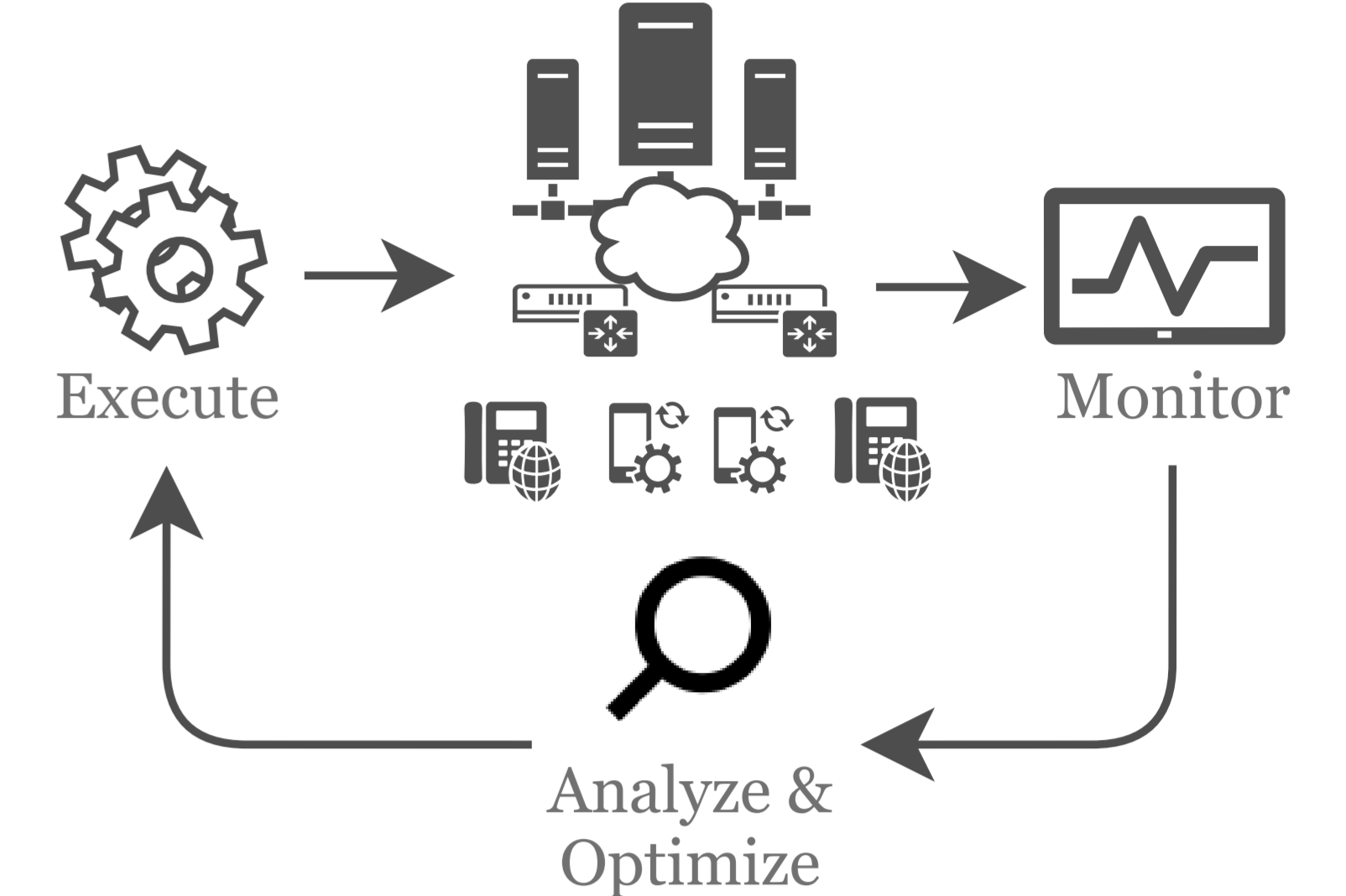
We teach the basics of operating systems and distributed systems in Computer Science and related bachelor programs as well as advanced courses in this area in the respective master programs at TU Berlin. Additionally, we offer seminars, projects, and topics for these.

We believe our curriculum will prepare you well for a successful career in the industry and academia, especially if you want to be involved with system operations and big data engineering!

Areas of Research

The complexity of distributed and operating systems increases together with requirements for resiliency, responsiveness, and resource-efficiency. The research of our group is focused around methods for resource management and fault tolerance in distributed and operating systems including:

- Continuous monitoring, profiling, and testing
- QoS-aware scheduling and system configuration
- Anomaly detection, fault localization, and auto-remediation



Teaching

Bachelor

Core Bachelor Courses

Systemprogrammierung

This module provides a basic understanding of machine-oriented programming as well as the structure and functionality of operating systems. It covers the theory of concurrent processes, their synchronization and communication.

ECTS 6 TERM SS

Verteilte Systeme

This module provides knowledge about the architecture and functionality of distributed systems. Characteristic properties and system models are considered from the areas of computer communication, operating systems and security.

ECTS 6 TERM SS

Practical Courses & Seminars

Programmierpraktikum: Skalierbare Systeme

This module provides knowledge and practical experience in the field of modern, distributed and complex IT systems. It focuses on software design, programming, deployment, and maintenance of distributed, web-based systems.

ECTS 6 TERM SS

Bachelor Seminar: Operating Complex IT Systems

In this module students gain knowledge of recent research in the field of distributed and operating systems. On completion, students will possess methodical skills specific to the preparation of literature, scientific writing, and formal.

ECTS 3 TERM SS / WS

Programmierpraktikum: Verteilte Systeme

Graduates of this module gain practical experience and in the field of modern, distributed and complex IT systems. The focus is on software design, implementation and deployment of distributed systems. This module is a project.

ECTS 9 TERM WS

Bachelor Thesis at DOS

After completing the majority of your courses you can write your thesis with us. Depending on your course of study, you will spend between 3 and 5 months on a topic from our group's current research areas. While there are always some topics available on our website, do not hesitate to have a look at current research projects and efforts at our group and get in touch with researchers who work on topics that you are interested in.

To ensure the successful completion of your thesis, we have a couple of requirements for prospective thesis students. We expect the completion of elective courses at our group, including a seminar or project. You should possess basic academic writing skills and be familiar with common tools for version control and LaTeX. Depending on the topic, experience in a related programming language and a clean coding style are necessary. Moreover, while we are available for support and guidance, we expect students to work determined and independently.

For all thesis related information, visit our website at <http://dos.tu-berlin.de>

Master

Core Master Courses

Cloud Computing

In this module students will gain knowledge about the central concepts and technologies of cloud computing at a theoretical and a practical level. They will also understand user requirements and current solutions in this area.

ECTS 6 TERM WS

Betrieb Komplexer IT Systeme

This module provides knowledge of virtualization, high availability, storage connectivity, and system security in IT infrastructures, allowing for the application of current approaches to building IT infrastructures in a goal-oriented manner.

ECTS 6 TERM WS

Advanced Master Courses

Master Seminar: Operating Complex IT Systems

This module provides knowledge about recent research results and trends in the domain of operating complex IT systems. Participants gain methodological skills in preparing current research topics, scientific writing and official presentation.

ECTS 3 TERM SS / WS

Master Project: Distributed Systems

This module provides participants with the ability to formulate scientific questions / theses in this field, develop solutions and systematically produce and present results for the validation of scientific questions.

ECTS 9 TERM SS / WS

Master Thesis at DOS

If you specialized in our current areas of research, you are welcome to write a thesis with us at the end of your Masters program. In the course of 6 months, you will independently work on a research topic, which you define together with one of our researchers. Check out the thesis topics listed on our web site, and take a look at the research activities of our colleagues - do not hesitate to get in touch if you see an interesting topic!

We expect Masters students to be experienced in working independently on a long-running project. We also expect you to follow the same guidelines and requirements as Bachelors students (see the info box above). Compared to bachelor thesis topics, master theses dig deeper into the respective field and have higher requirements on the theoretical part.

Career Paths

DOS PhD Student



We are contributing to public and industrial research in several projects, ranging from fundamental to applied, and regularly publish at renowned international conferences. Besides profound knowledge of subjects from our lectures and interest in our current research, the best way to prepare for a PhD in our group is to closely work with one DOS researcher before joining. We, thus, recommend to write your master thesis with us!

DevOps / SRE

DevOps and Site Reliability Engineers combine software development with system administration to improve the life-cycle of IT services. They work with various tools to implement continuous integration and deployment, mostly in cloud environments. Technologies such as virtualization and containerization are leveraged to make IT systems more scalable, reliable and efficient.

Big Data Engineer



Data is one of the most valuable resources in the world today. It is the responsibility of big data engineers to design and implement the complex scalable infrastructures which collect, store, process, and analyze this resource. Approaches to big data processing fit broadly into two categories: batch data processing and stream data processing. Big data engineers are highly sought after in industry as well as in scientific research.