



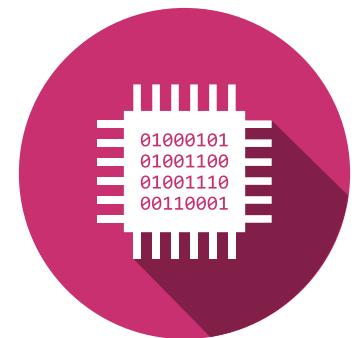
# Digitales Design (DiD)

## Einführung

### IND

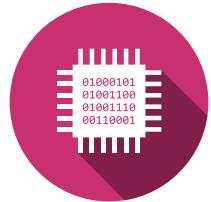
Studiengang Systemtechnik  
Studiengang Energie und Umwelttechnik  
Studiengang Informatik und Kommunikationssysteme

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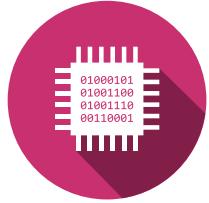
# ISC Module 1. Jahr

<https://www.hevs.ch/media/document/20/plan-etude-isc-v1-02.pdf>



	<i>Vorlesungen</i>	<i>Stunden</i>	<i>Credits</i>
	<b>Semester 1</b>	<b>32</b>	<b>28</b>
	Lineare Algebra 1	4	4
	Analysis 1	6	5
	Kommunikation 1	2	2
	Ethik und Rechtespekte	2	2
	Sprachen 1	4	3
	Imperative Programmierung	8	7
	<i>Digitale Technik</i>	6	5
1. Jahr	<b>Semester 2</b>	<b>36</b>	<b>32</b>
	Lineare Algebra 1	4	4
	Analysis 2	6	5
	<i>Computerarchitektur</i>	4	3
	Kommunikation 2	2	2
	Sicherheitbewusstsein	4	3
	Sprachen 2	4	3
	Objektorientierte Programmierung	8	6
	Netzwerke	4	6
	Projekt 1		
			Summer school
ZaS	DiD IND		

# Ziel des Kurses



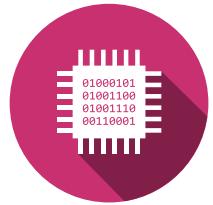
Das funktionale Pflichtenheft eines einfachen Systems interpretieren (C) und es digital darstellen können (A).

Die Grundprinzipien des digitalen Designs nach den vorgeschlagenen Methoden anwenden (A).

Die daraus abgeleitete logische Funktion realisieren (A)

Validieren des erstellten digitalen Designs anhand von Simulations- und Testmethoden (J)

# Inhalt des Kurses



Pflichtenheft

$Q_A$	$Q_B$	$Q_A^+$	$Q_B^+$
0	0	1	0
0	1	0	0
1	0	1	1
1	1	0	1

Zustandstabellen

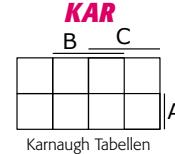
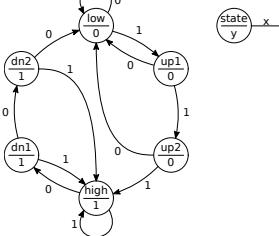
MSb **NUM** LSB  
11110101  
Binary digit IT

Wahrheitstabellen

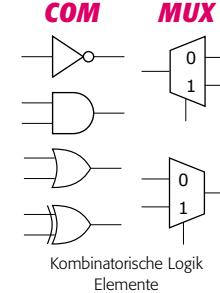
a	b	y
0	0	0
0	1	1
1	0	1
1	1	0

$Q_A$	$Q_B$	$Q_A^+$	$Q_B^+$
0	0	1	0
0	1	0	0
1	0	1	1
1	1	0	1

Zustandstabellen



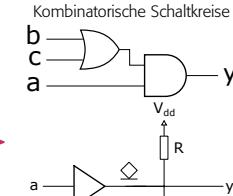
Binary digit IT



Polynomiale Gleichungen  
 $Q_0^+ = \overline{Q_0}$   
 $Q_1^+ = Q_0 \oplus Q_1$

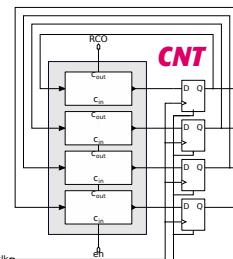
$y = a(b+c) = ab + ac$

Kombinatorische Schaltkreise

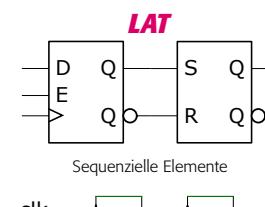
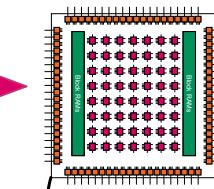


**LST**

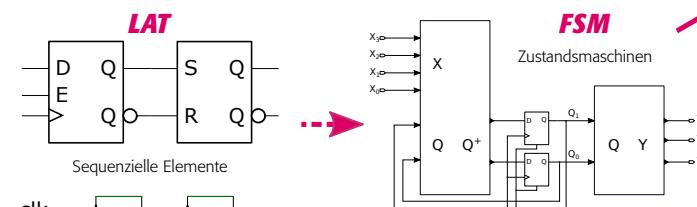
Zähler



**FPGA**

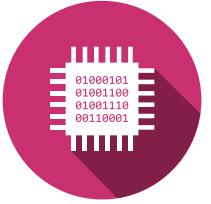


DiD IND



DiD IND

# Witz

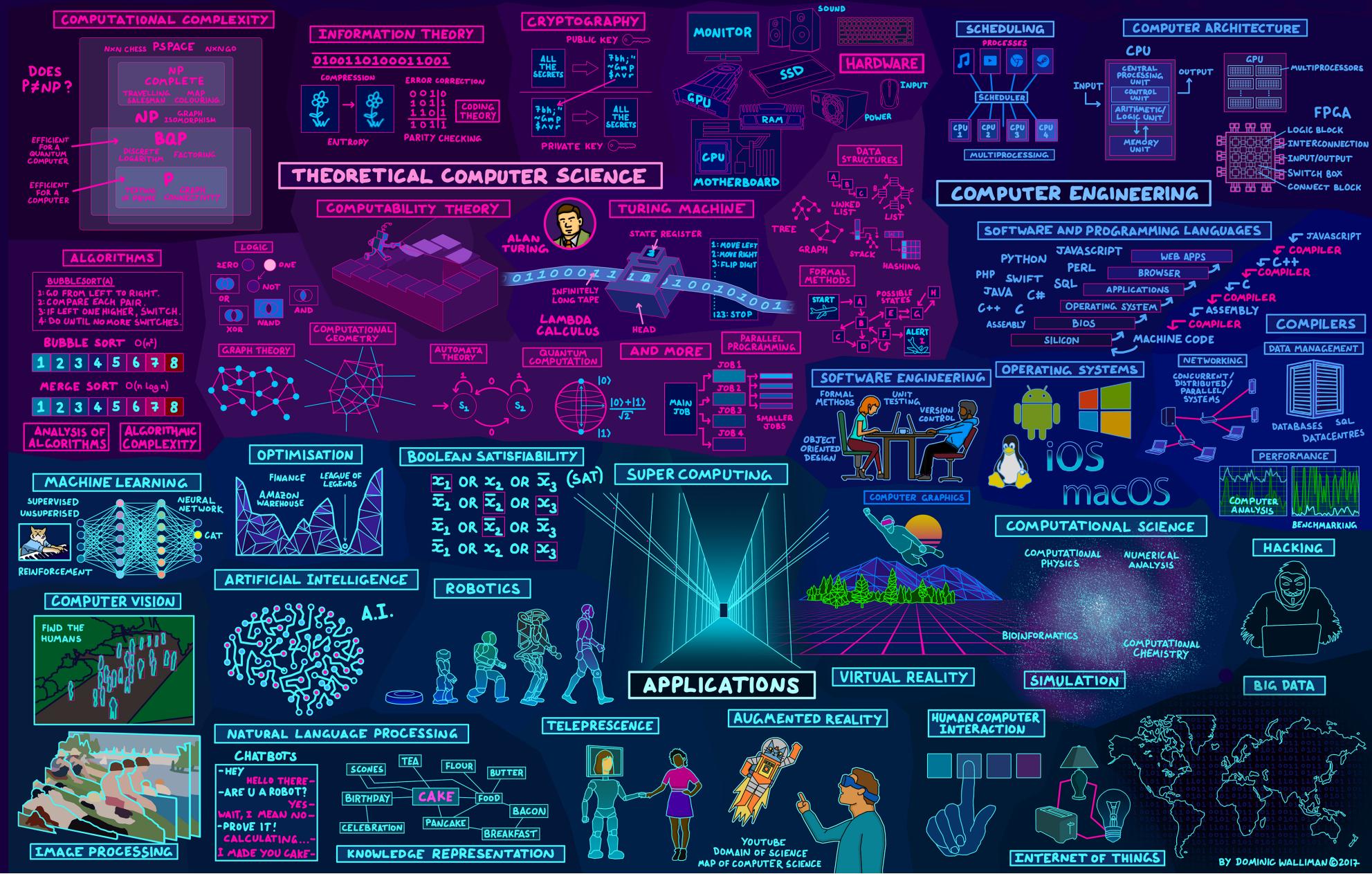


There are 10 types of people in this world. Those who understand binary and those who don't.

Es gibt 10 Arten von Menschen auf dieser Welt. Diejenigen, die das Binäre verstehen und diejenigen, die es nicht verstehen.

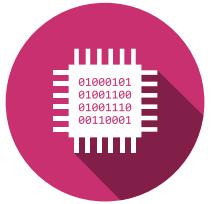
# Map of Computer Science

# Computer Science



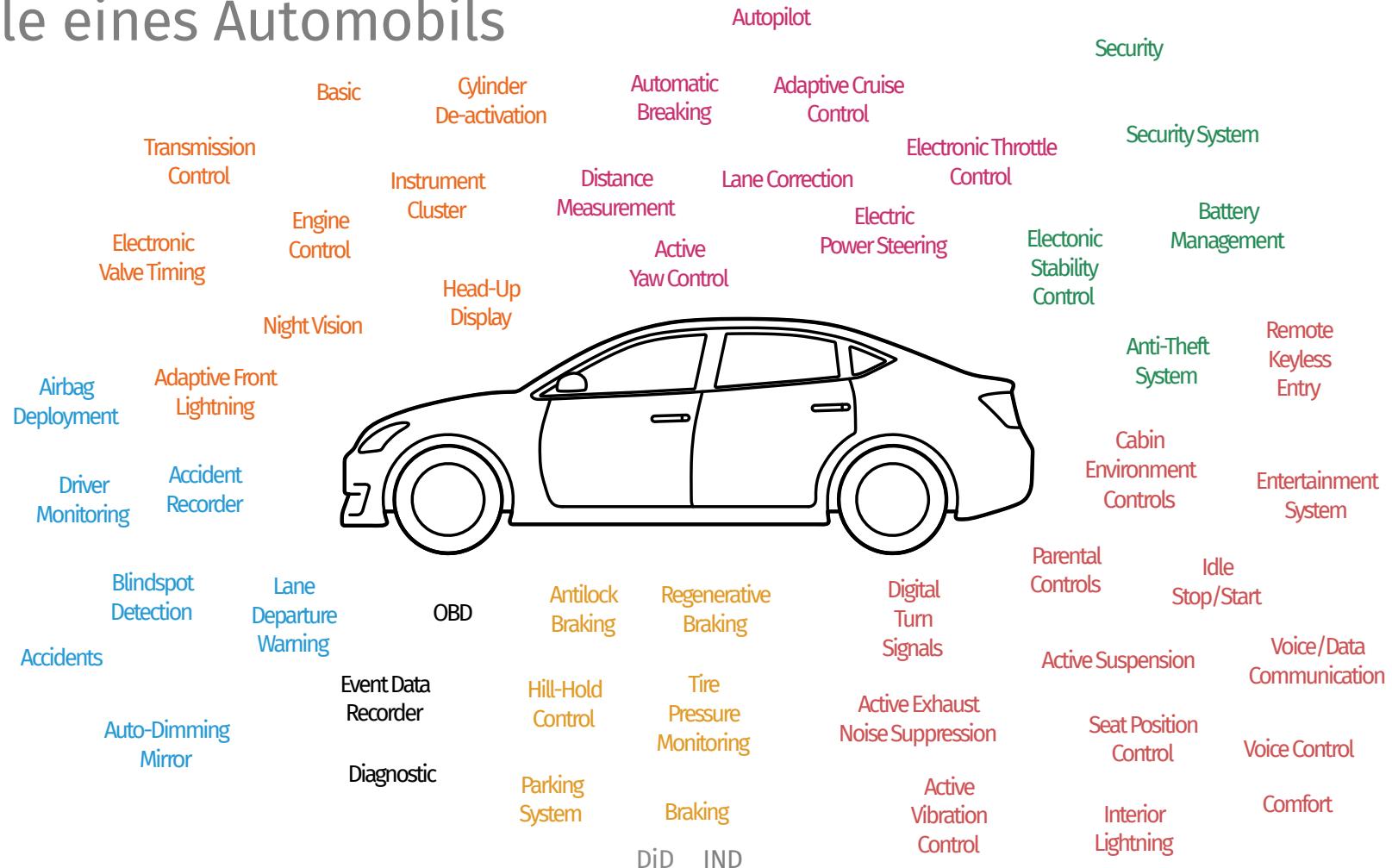
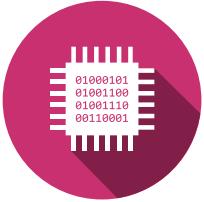
# Numerische Elektrotechnik

## Anwendungsbereiche



# Numerische Elektrotechnik

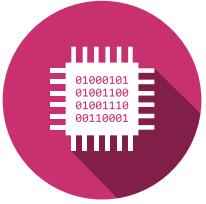
## Beispiele eines Automobils



# Numerische Elektrotechnik

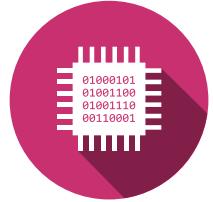
## Ariane 5

[https://youtu.be/PK\\_yguLapgA](https://youtu.be/PK_yguLapgA)

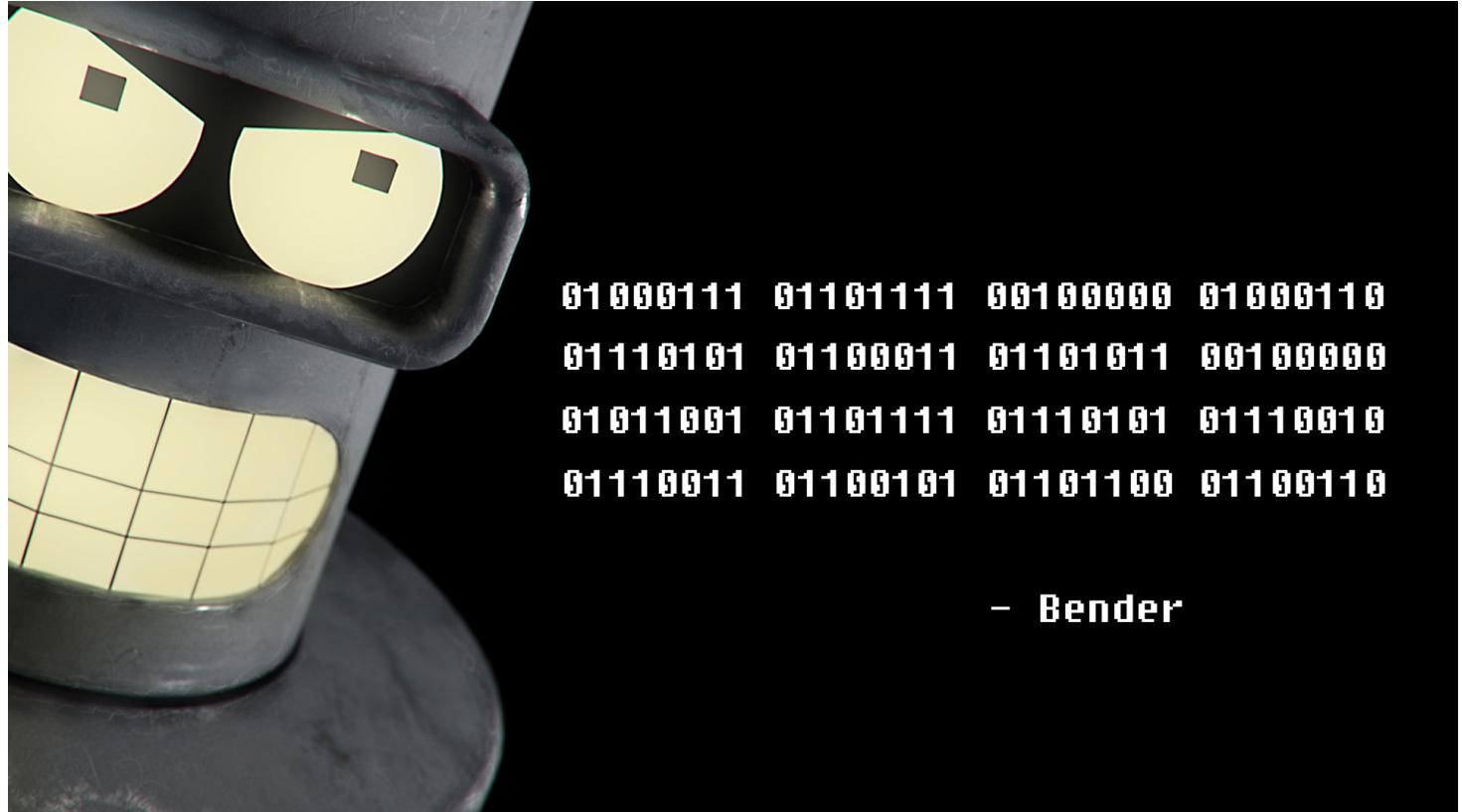
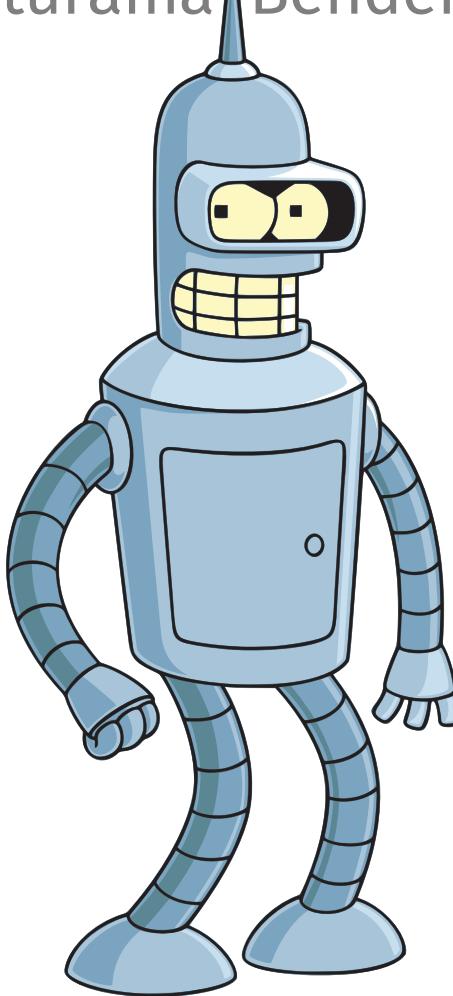


# Numerische Elektrotechnik

## Futurama Bender



[https://youtu.be/\\_4TPlwwHM8Q](https://youtu.be/_4TPlwwHM8Q)

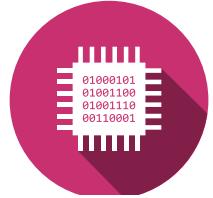


01000111 01101111 00100000 01000110  
01110101 01100011 01101011 00100000  
01011001 01101111 01110101 01110010  
01110011 01100101 01101100 01100110

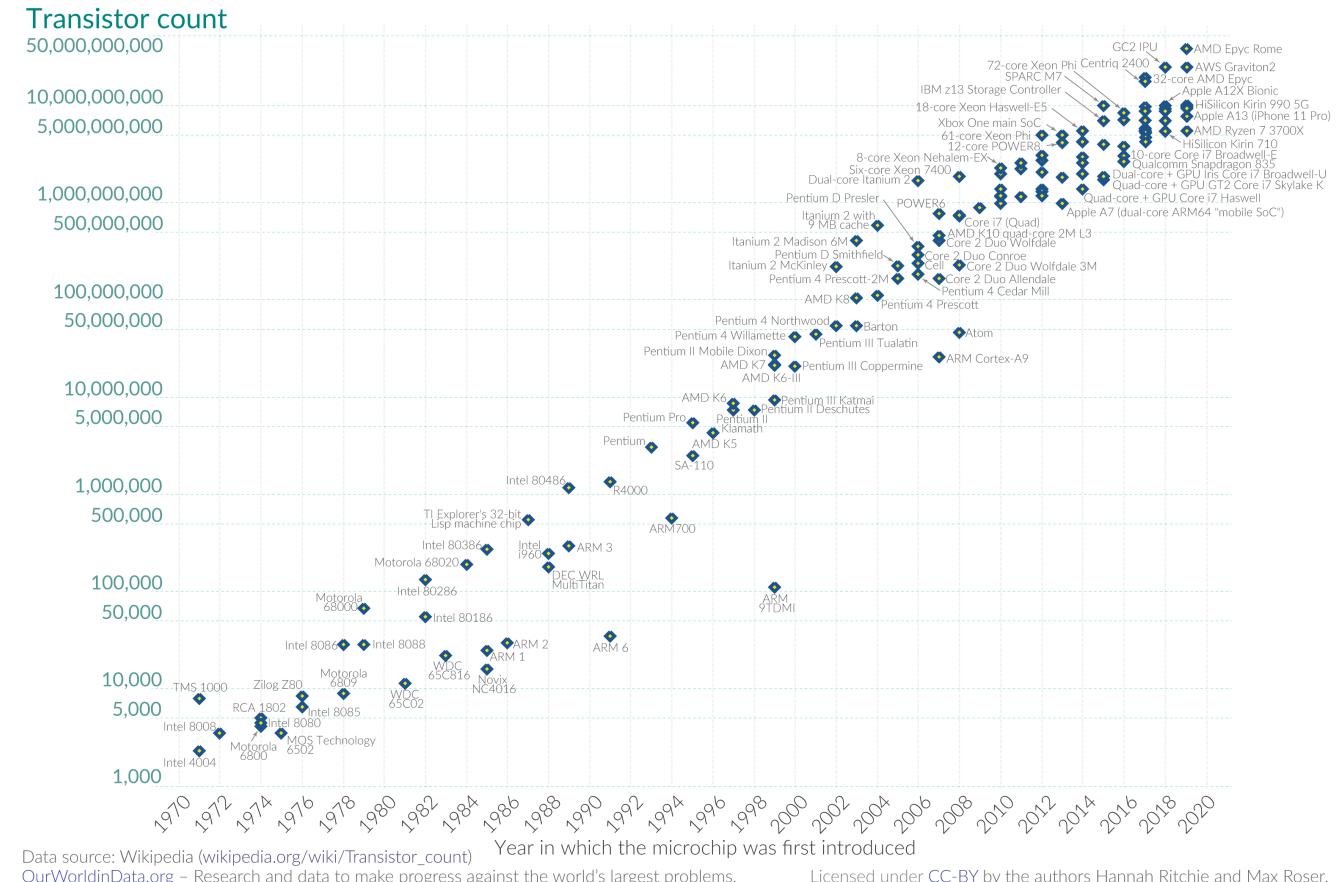
- Bender

# Numerische Elektrotechnik

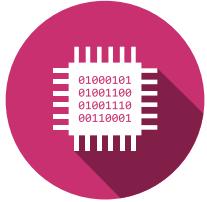
## Moore's Law



*Number of transistors double  
every two years  
- Gordon Moore -*



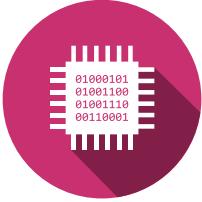
# ISC Organisation



- Kurs ( $2^{Stunden/Woche}$ )
- Labore ( $4^{Stunden/Woche}$ )
- Projekt (Display  $\approx 3 - 5$  Wochen)
- Prüfung
  - Woche 47 (17.11.25 – 21.11.25)

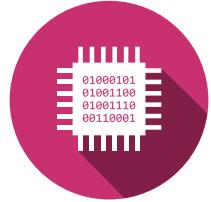
	Herbstsemester (DiD)			Frühlingssemester (CAr)		
Bewertung	Exa 1	Project	Exa Sem	Exa 1	Project	Exa Sem
Koeffizient	0.5	0.5	1	0.5	0.5	1
Semester	1		1	1		1
Module	5/9			4/9		

# Allgemeine Zusammenarbeit



- Die Anwesenheit im Unterricht ist Pflicht.
  - Nur die Lehrer können eine Befreiung erteilen
  - Bei längere Absenz => Information an den Studiengangsverantwortlichen
- Unbedingt Notizen machen, vor allem bei Beispielen und Übungen
- Zusätzliche Übungen müssen zu Hause gemacht
  - Eigene Arbeit unerlässlich
- Verwendung von Mobiltelefonen
  - Verboten im Unterricht Pausenzeiten nutzen
- Essen und Trinken im Unterricht
  - Im Unterricht verboten

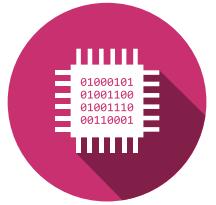
# Nachhilfe



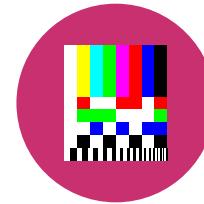
- Gemäss der Modulbeschreibung
- Obligatorisch bis zur ersten Prüfung, in der Ihr Niveau festgestellt wird.
- Eine ausgezeichnete Gelegenheit, Übungen zu machen

# Semesterprojekt

## Informatik und Kommunikationssysteme

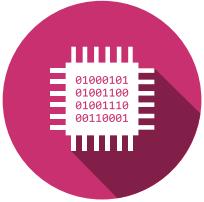


### Display



DiD IND

# Organisation Professoren



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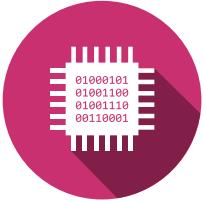


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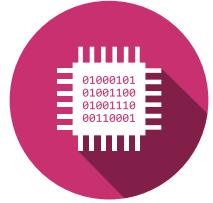
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# Server und Dateien

## Informatik und Kommunikationssysteme

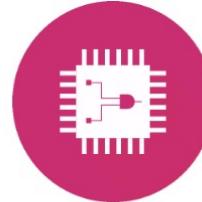


- **Moodle ISC Learn**

- 102.1 – Digital design
- Password: *welcome*

INFORMATIONS DU MODULE –  
MODULINFORMATIONEN

MODULE DID – KURS DID



- **Microsoft Teams**

- 25\_ISC\_Car
- Access Code: **ia5sw6e**

Le module "102 Architecture materielle" est composé des deux cours suivants: 102.1 Systèmes numériques et 102.2 Architecture des ordinateurs.

Vous trouverez tous les documents de cours sur le repo Git.

Das Modul "102 Materielle Architektur" besteht aus den beiden folgenden Kursen:  
102.1 Digitale Systeme und 102.2 Computerarchitektur

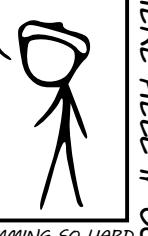
The screenshot shows the Microsoft Teams application interface. On the left, there's a sidebar with icons for Activity, Chat, Teams (selected), Assignments, and Apps. The main area displays a team named "20\_ein\_se1d" with sections for "General" and "Announcements". To the right, there are two large buttons: "Join or create a team" and "Join a team with a code". Below these buttons, there's a text input field labeled "Enter code" with the number "2" next to it, and a "Join team" button.

WHY ARE THERE MIRRORS ABOVE BEDS  
WHY DO I SAY UH  
WHY IS SEA SALT BETTER  
WHY ARE THERE TREES IN THE MIDDLE OF FIELDS  
WHY IS THERE NOT A POKEMON MMO  
WHY IS THERE LAUGHING IN TV SHOWS  
WHY ARE THERE DOORS ON THE FREEWAY  
WHY ARE THERE SO MANY SVHOST-EXE RUNNING  
WHY AREN'T ANY COUNTRIES IN ANTARCTICA  
WHY ARE THERE SCARY SOUNDS IN MINECRAFT  
WHY IS THERE KICKING IN MY STOMACH  
WHY ARE THERE TWO SLASHES AFTER HTTP  
WHY ARE THERE CELEBRITIES  
**WHY DO SNAKES EXIST**  
WHY DO OYSTERS HAVE PEARLS  
WHY ARE DUCKS CALLED DUCKS  
WHY DO THEY CALL IT THE CLAP  
WHY ARE KYLE AND CARTMAN FRIENDS  
WHY IS THERE AN ARROW ON AANG'S HEAD  
WHY ARE TEXT MESSAGES BLUE  
WHY ARE THERE MUSTACHES ON CLOTHES  
WHY WUBA LUBBA DUB DUB MEANING  
WHY IS THERE A WHALE AND A POT FALLING  
WHY ARE THERE SO MANY BIRDS IN SWISS  
WHY IS THERE SO LITTLE RAIN IN WALLIS  
WHY IS WALLIS WEATHER FORECAST ALWAYS WRONG

**WHY ARE THERE MALE AND FEMALE BIKES**

WHY ARE THERE BRIDESMAIDS  
WHY DO DYING PEOPLE REACH UP  
HOW FAST IS LIGHTSPEED  
WHY ARE OLD KLINGONS DIFFERENT

**WHY ARE THERE SQUIRRELS**



WHY IS THERE HELL IF GOD IS LOVE  
WHY IS THERE NO GPS IN LAPTOPS  
WHY DO KNEES CLICK  
WHY AREN'T THERE E GRADES  
WHY ARE PROGRAMMING SO HARD

# QUESTIONS

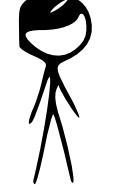
CAN BE ASKED BY ANYONE ANYTIME

WHY AREN'T ECONOMISTS RICH  
WHY DO AMERICANS CALL IT SOCCER  
**WHY ARE MY EARS RINGING**  
WHY IS 42 THE ANSWER TO EVERYTHING  
WHY CAN'T NOBODY ELSE LIFT THORS HAMMER  
WHY IS MARVIN ALWAYS SO SAD

WHY IS THERE A SWARM OF ANTS  
WHY IS THERE PILGRIM  
WHY ARE THERE SO MANY CROWS IN ROCHESTER  
**WHY IS TO BE OR NOT TO BE FUNNY**  
WHY DO CHILDREN GET CANCER  
WHY IS POSEIDON ANGRY WITH ODYSSEUS  
**WHY IS THERE ICE IN SPACE**

**WHY ARE THERE ANTS IN MY LAPTOP**

WHY IS EARTH TILTED  
WHY IS SPACE BLACK  
WHY IS OUTER SPACE SO COLD  
WHY ARE THERE PYRAMIDS ON THE MOON  
WHY IS NASA SHUTTING DOWN

WHY ARE THERE GHOSTS  


WHY IS THERE AN OWL IN MY BACKYARD  
WHY IS THERE AN OWL OUTSIDE MY WINDOW  
WHY IS THERE AN OWL ON THE DOLLAR BILL

**WHY DO OWLS ATTACK PEOPLE**  
**WHY ARE FPGA's EVERYWHERE**  
WHY ARE THERE HELICOPTERS CIRCLING MY HOUSE

WHY ARE THERE GODS  
WHY ARE THERE TWO SPOCKS  
WHY ARE MY BOOBS ITCHY  
WHY ARE CIGARETTES LEGAL  
WHY ARE THERE DUCKS IN MY POOL

WHY IS JESUS WHITE  
WHY IS THERE LIQUID IN MY EAR  
WHY DO Q TIPS FEEL GOOD  
WHY DO PEOPLE DIE

WHY IS LIFE SO SHORT  
**WHY ARE THERE OBELISKS**  
WHY ARE WRESTLERS ALWAYS WET  
WHY ARE OCEANS BECOMMING MORE ACIDIC

WHAT IS <https://xkcd.com/1256/>

WHY DO THEY SAY T-MINUS

WHY ARE THERE FEMALE

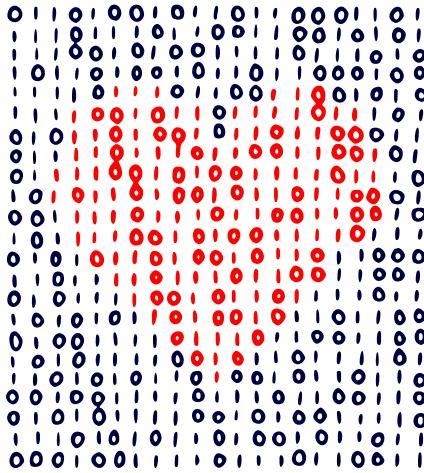
WHY ARE THERE OBELISKS

WHY ARE WRESTLERS ALWAYS WET

WHY ARE OCEANS BECOMMING MORE ACIDIC



WHY AREN'T THERE GUNS IN HARRY POTTER



Hes·so // VALAIS  
WALLIS



Haute Ecole d'Ingénierie  
Hochschule für Ingenieurwissenschaften

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