

INNOVATION SPRINT

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ÜBERSICHT

1. Letzte Meile
2. 5G
3. Mobile Packstation
4. Medikamenten App
5. Medikamenten Echtheitskontrolle
6. Machine Learning on Mobile
7. Digital Twins
8. SmartEnergy

LETZTE MEILE

- Weg vom Paketzentrum zum Empfänger

PROBLEME:

- Empfänger (bzw. Nachbarn) nicht zuhause um Paket entgegenzunehmen
- => 2. oder gar 3. erfolgloser Zustellversuch
- Hermes schätzt: **Hälfte** der Zustellkosten entfallen auf letzte Meile

IDEEN:

- Packstation
- Crowd Delivery
- Drohnen / Roboter
- Routenplanungsoptimierung
- letzte Meile als Premiumservice
- Gamification?
- letzte Meile nicht Kernkompetenz => Entkoppelung?

KRITIK:

- nur Händler (Versender) im Blick nicht Empfänger
- Geschäftsmodell: Zufriedenheit der Händler (Kosten, Effizienz)
- => Kosten auf letzter Meile senken (Paketstation, Roboter, Drohnen)
- Eigentlicher Kunde: Empfänger

EMPFÄNGER-WÜNSCHE:

- digital in den Zustellprozess eingreifen
- garantierte persönliche Zustellung durch Zeitfensterangabe
- Mitnahme von Retouren
- Pakete gebündelt am Samstagvormittag

"INTERAKTIVE" LETZTE MEILE?

LINKS:

- <https://www.zeit.de/zeit-wissen/2018/06/digitalisierung-probleme-logistik-internet-unterschiede-stadt-land>
- <https://www.dvz.de/rubriken/logistik/detail/news/letz-meile-ohne-dhl-co.html>
- <https://www.biek.de/download.html?getfile=1928>
- <https://newsroom.hermesworld.com/trend-crowd-delivery-chancen-und-risiken-des-sharing-economy-modells-14993/>

5G

FAKTEN:

- Datenrate: 100 Mbit/s (4G) => 20 Gbit/s (Ø = 100 Mbit/s bzw. 1 Gbit/s (hotspot))
- Latenz: 10 - 70 ms (4G) => <1 ms
- Frequenzbereiche: <6 GHz, >20 GHz
- Abwärtskompatibilität auf 4G
- Echtzeitübertragung: 100 Milliarden Geräte gleichzeitig ansprechbar
- Energieverbrauchkostensenkung: 1/1000 pro Bit, 1/10 je Mobildienst

ERWARTUNGEN / POTENTIELLE ENTWICKLUNGEN:

- vorerst regionaler, industrieller Einsatz + Städte
- Flächenausbau vorerst LTE
- Konkurrenz für bestehende Breitbandanschlüsse?
- erschwingliche / massentaugliche Daten-Flats?

IMPACT:

CLOUD COMPUTING:

- cloud robotics (processing in cloud -> cheaper machines)
- connected traffic cloud: operational decision making

AR / VR:

- AR wayfinding (ÖPNV)
- assist or train service technicians
- VR shopping mobil
- AR shopping im Geschäft
- mobiles AR/VR product setting visualization

AUDIO/VIDEO:

- mobiles 4K Streaming/VOD/TV
- 3D broadcasts
- 4K, 360° shopping
- realtime Audio

REMOTE:

- monitoring, controlling
- advanced metering infrastructure
- predictive maintenance
- quality inspection/diagnostic

SMART:

- autonome Fahrzeuge
- smart objects

LINKS:

- <https://files.vogel.de/vogelonline/vogelonline/files/97c>
- <https://en.wikipedia.org/wiki/5G>
- <https://www.n-tv.de/technik/Wird-Deutschland-mit-5-Masten-gespickt-article20854045.html>

MOBILE PACKSTATION

MEDIKAMENTEN APP

*Medikamenten Scanner: App sagt was
Nebenwirkungen sind & empfiehlt was
nicht zusammen genommen werden kann*

APPS

- PGXperts Interaktions Check
- PocketPharmacist
- Drugs.com
- Dosecase
- MyMeds
- MedHelper App

PORTALE:

- <https://www.psiac.de> (7 Tage kostenlos)
- <https://www.pharmawiki.ch> (kostenlos)

QUELLEN

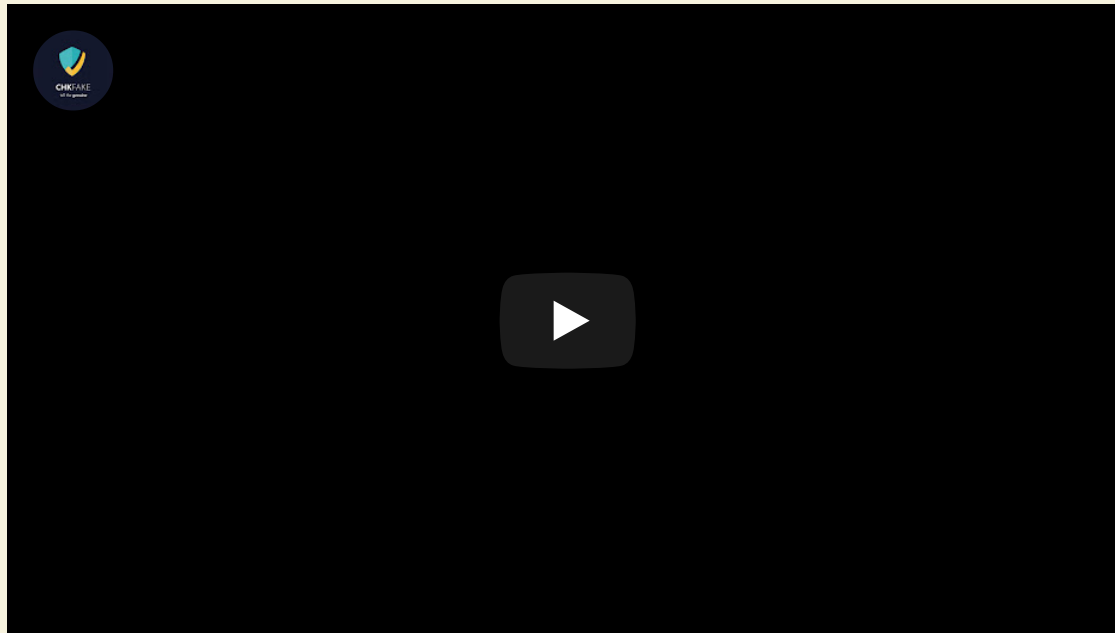
- <https://www.dr-hempel-network.com/digital-health-technology/top-10-mobile-apps-in-medication-management/>

MEDIKAMENTEN ECHTHEITSKONTROLLE

- *Medikamenten Echtheitskontrolle & Herstellungsporzessgarantie (z.B. Blockchain)*
- *Barcode/Seriennummerscanner*
- *Verbraucher Hinweise ("oft gefälscht")*
- *Global*
- *Fotovergleich*
- *Unabhängig & Datenschutz konform*

CHKFAKE APP

- Fake Checker für den indischen Markt
- Nicht eingeschränkt auf Medikamente



<https://www.chkfake.com/>

HOW TO IDENTIFY FAKE MEDICINES IN INDIA

Fake medicines in India is a big problem. As pharmaceutical companies are highly profitable, many counterfeits are lured towards creating duplicate medicines, causing a threat to human lives.



Presented by:



Source: www.bit.ly/verifymedicine
or www.medlife.com/blog

Scan QR Code



SCHREINER MEDIPHARM - BITSECURE



- small, randomly-generated high-resolution pattern that is able to be instantly authenticated via consumers' mobile app.
- If the medication is counterfeit, the image's quality will deteriorate

<https://www.schreiner-group.com/en/closure-seal/bitsecure.html>

MEDLIFE - VERIFY MEDICINES

Online or SMS:

- PharmaSecure is working with manufacturers to protect against counterfeits. Unique Identification Code along with a barcode is printed on medicine packages or strips. Consumers can send the unique “Authentication code” by SMS to 9901099010 to receive an authentication message from the pharmaceutical manufacturer to confirm the authenticity of the drug being purchased.

QUELLEN

- <https://www.psfk.com/2018/09/bitsecure-mobile-phone-authentication-app.html>
- <https://www.neue-verpackung.de/47184/sicherheit-fuer-individuelle-produkt-faelschungssicherheit-und-serialisierung>
- <https://www.schreiner-group.com/de/verschlusssiegel>
- <https://www.elektroniknet.de/elektronik/elektronikfehler-per-laser-beschriften-152048.html>
- <https://www.medlife.com/blog/10-ways-check-fake-medicine>

MACHINE LEARNING ON MOBILE

CoreML & Mobile

Bildverarbeitung

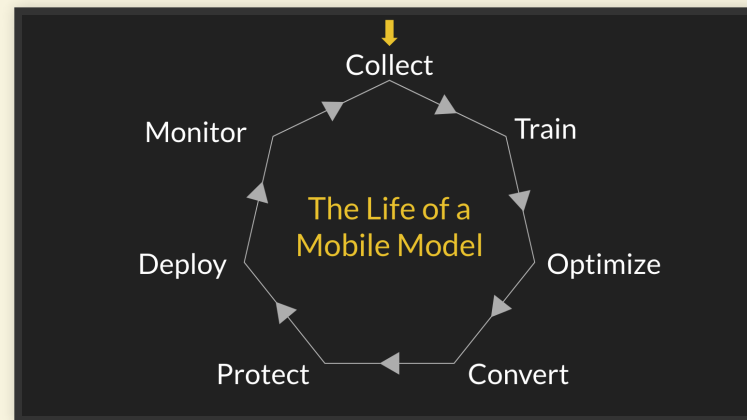
Privacy

Data Collection/Classification auf Edge

Devices

DSGVO

LIFECYCLE



In App:

Train new model -or- Use pre-trained model

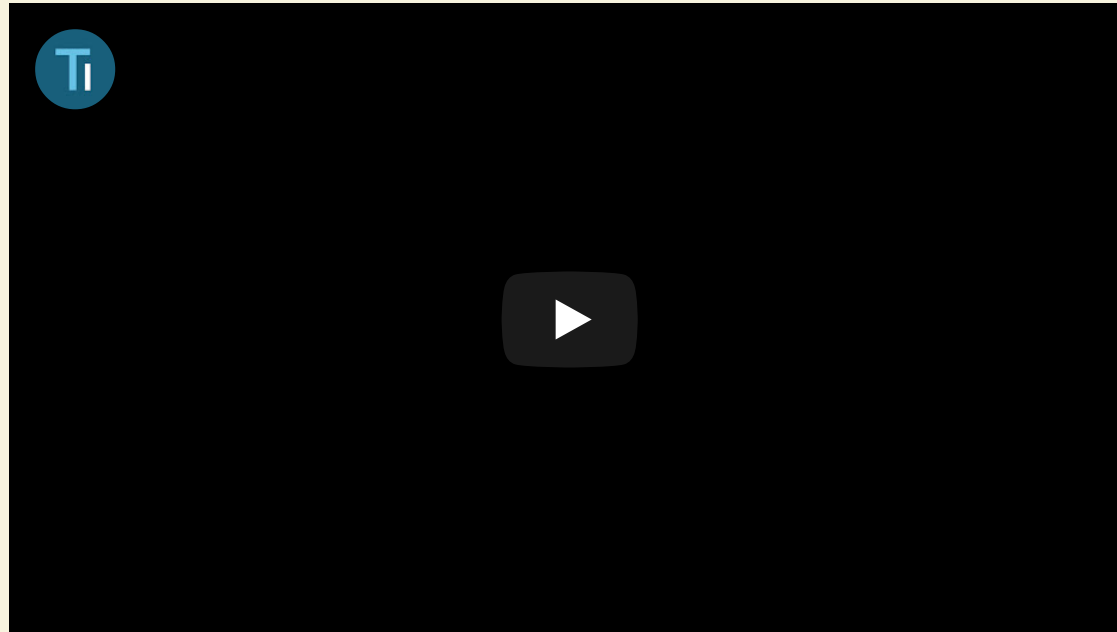
GRÜNDE FÜR ML ON MOBILE

- Genauigkeit
- Verfügbarkeit
- Kosten
- Unmittelbarkeit
- Leistung
- Datenschutz
- Nutzerspezifisch

BEISPIELE FÜR ML ON MOBILE

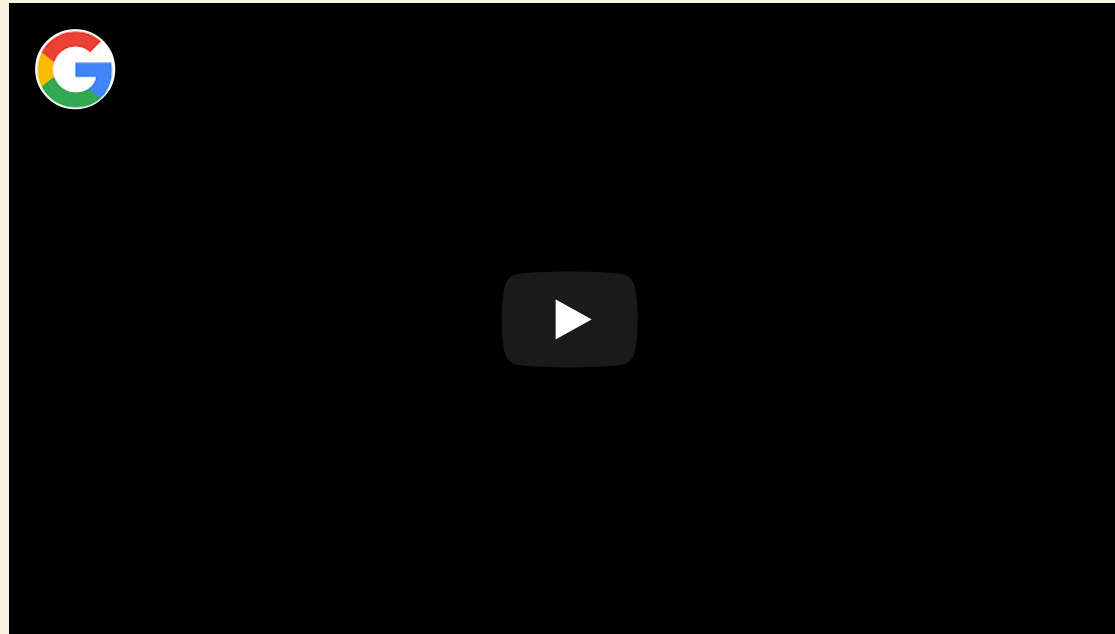
- Aktivitätserkennung (z.B. Raise-to-wake)
- Biometrischeserkennung & -verifikation (z.B. FaceID, TouchID)
- Orientierungspunkte erkennung (Indoor-Navigation)
- Optical character recognition (OCR) / Handschrifterkennung
- Personalisierte Gesprächsmodelle & Smart Reply
- Erkennung von verdächtigen Aktivitäten
- Voice/Speech recognition, Text to speech
- Personalisierte Werbung, Predictive analytics & Empfehlungen

USE CASES - CREATIVITY



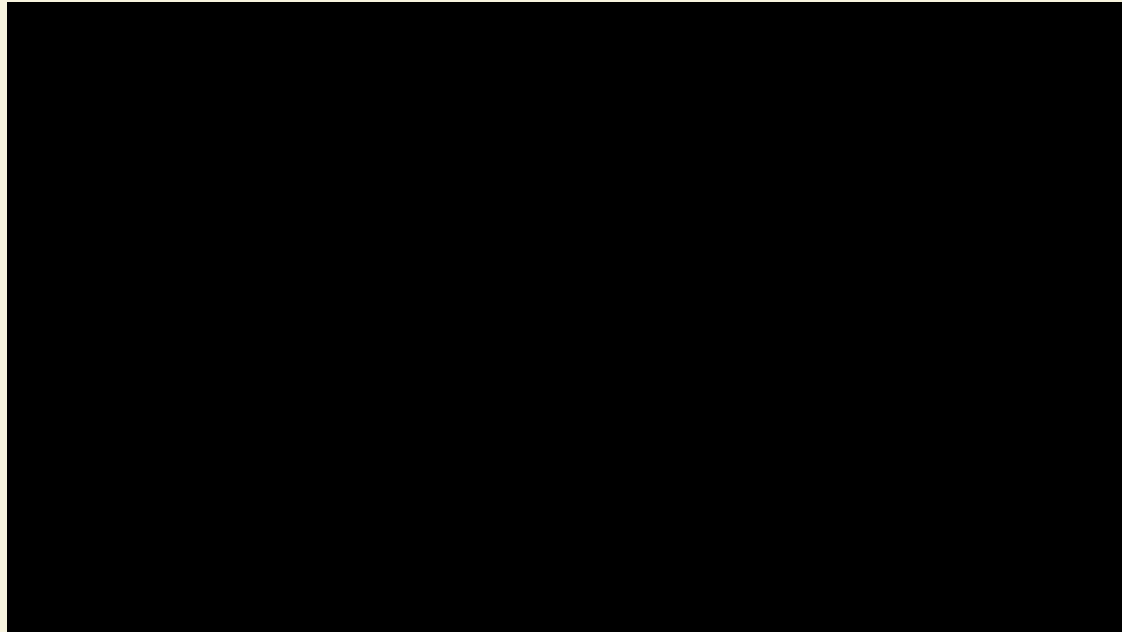
- GIF Maker by Momento
- Prisma
- Panda
- Meitu

USE CASES - CORE UI / UX



- Superimpose X
- Homecourt
- PlantVillage
- Subreddit Suggester
- Polarr

USE CASES - PRIVACY & HEALTH



- FaceID
- MDAcne, tracks skin health over time with computer vision algorithms running right on the phone.

FRAMEWORKS / TOOLS

- TensorFlow Mobile/Lite
- Firebase ML Kit
- Core ML / Create ML
- Fritz Mobile SDK / Fritz.ai
- Google Cloud AutoML
- Clarifai Mobile SDK
- Amazon Rekognition, Polly, Lex
- Microsoft Azure Cognitive Services
- IBM Watson
- Caffe2Go
- ...

SOURCES

- <https://heartbeat.fritz.ai/machine-learning-on-mobile-devices-3-steps-for-deploying-it-in-your-apps-48a0a24364a8>
- <https://heartbeat.fritz.ai/embracing-machine-learning-as-a-mobile-developer-4ebcda58d4ac>
- <https://heartbeat.fritz.ai/machine-learning-models-on-the-edge-mobile-and-iot-8a5384a370ba>
- <https://heartbeat.fritz.ai/the-lifecycle-of-mobile-machine-learning-models-759bff75ec3f>
- <https://machinethink.net/blog/training-on-device/>
- <https://machinethink.net/blog/machine-learning-device-or-cloud/>

<https://heartbeat.fritz.ai/machine-learning-on-mobile-devices-3-steps-for-deploying-it-in-your-apps-48a0a24364a8>

- <https://heartbeat.fritz.ai/from-ai-enabled-to-ai-first-tr-changing-mobile-landscape-308fb0e5adfc>
- <https://medium.com/coding-blocks/google-lens-firebase-54d34d7e1505>
- <https://heartbeat.fritz.ai/building-pokédex-in-android-using-tensorflow-lite-and-firebase-cc780848395>
- <https://msdn.microsoft.com/en-us/magazine/mt814802.aspx>
- <https://blog.algorithmia.com/machine-learning-and-mobile-deploying-models-on-the-edge/>
- <https://theappsolutions.com/blog/development/machine-learning-in-mobile-app/>
- <https://www.netguru.com/blog/machine-learning-on-mobile-core-ml-and-tensorflowlite-frameworks->

comparison

- <https://seventablets.com/blog/how-are-developers-using-machine-learning-for-mobile-apps/>
- <https://heartbeat.fritz.ai/machine-learning-on-ios-and-android-bd77f6e92c7b>
- <https://codeburst.io/ios-ml-kit-advantages-of-machine-learning-in-your-pocket-4ea39fc8282c>

DIGITAL TWINS

*Digital Twin Visualisierung via AR ->
Kaffee Partner*

- *3D Scan von Object*
- *Objekt erkennen (AI)*
*-> aggregieren zu gesamt
Unternehmensbild*

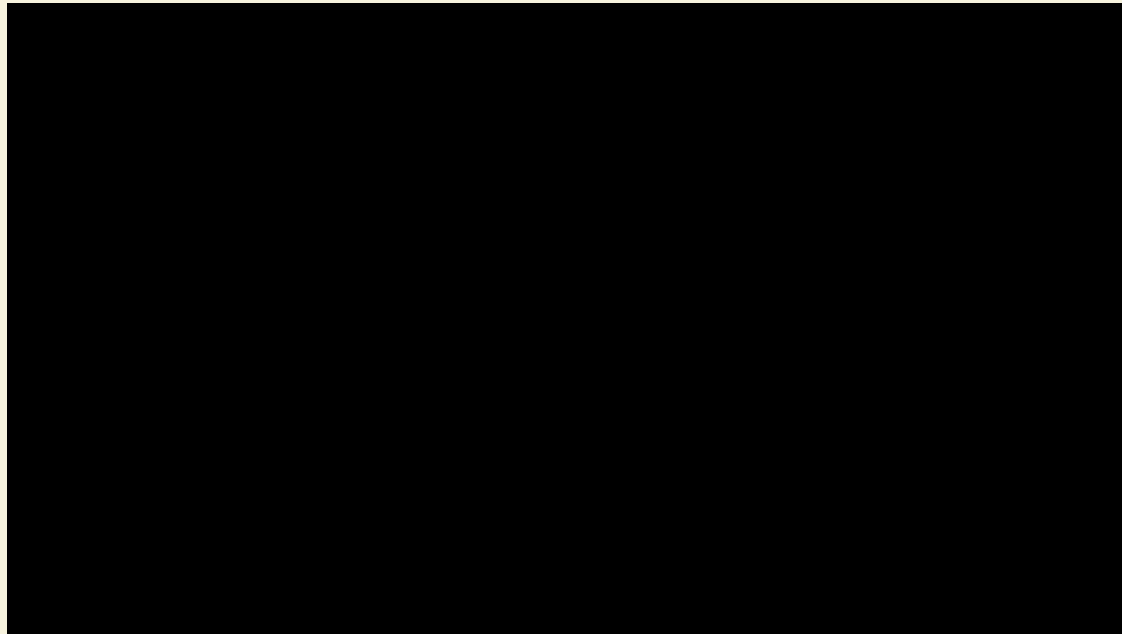
DIGITAL TWIN / DEVICE SHADOW

A digital twin is a digital replica of a living or non-living physical entity. By bridging the physical and the virtual world, data is transmitted seamlessly allowing the virtual entity to exist simultaneously with the physical entity. Digital twin refers to a digital replica of physical assets (physical twin), processes, people, places, systems and devices that can be used for various purposes.

BEISPIELE

- Turbinen (mit Voice Interaktion & MR (GE Digital))
- Jet Engines: IBM Watson IoT
- Lokomotiven
- Architektur / Gebäude
- Windturbinen
- Monitoring, Diagnose, Prognose, Performance
- Intelligent Maintenance Systems
- Smart Manufacturing
- Health care products
- Naturschutz/Artenschutz
- Traffic Simulation

MINDS + MACHINES: MEET A DIGITAL TWIN



DIGITAL TWINS

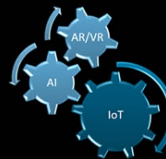
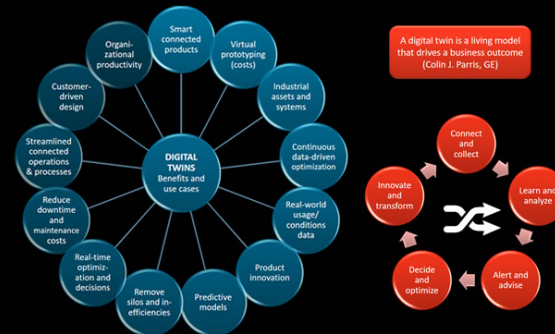
Digital twin technology trends and benefits in motion



www.i-scoop.eu/digital-twin-technology-benefits-usage-predictions/

By 2020, 30% of G2000 companies will be using data from digital twins of IoT connected products and assets to improve product innovation success rates and organizational productivity, achieving gains of up to 25%.

(IDC, November 2, 2017)



Digital twins are linked to their real-world counterparts and are used to understand the state of the thing or system, respond to changes, improve operations and add value. Organizations will implement digital twins simply at first, then evolve them over time, improving their ability to collect and visualize the right data, apply the right analytics and rules, and respond effectively to business objectives. Over time, digital representations of virtually every aspect of our world will be connected dynamically with their real-world counterpart and with one another and infused with AI-based capabilities to enable advanced simulation, operation and analysis

(Gartner, October 4, 2017)



- real time - real world - data - visualizations - decisions -



By 2021, 50% of large industrial companies will use digital twins, resulting in those organizations gaining a 10% improvement in effectiveness



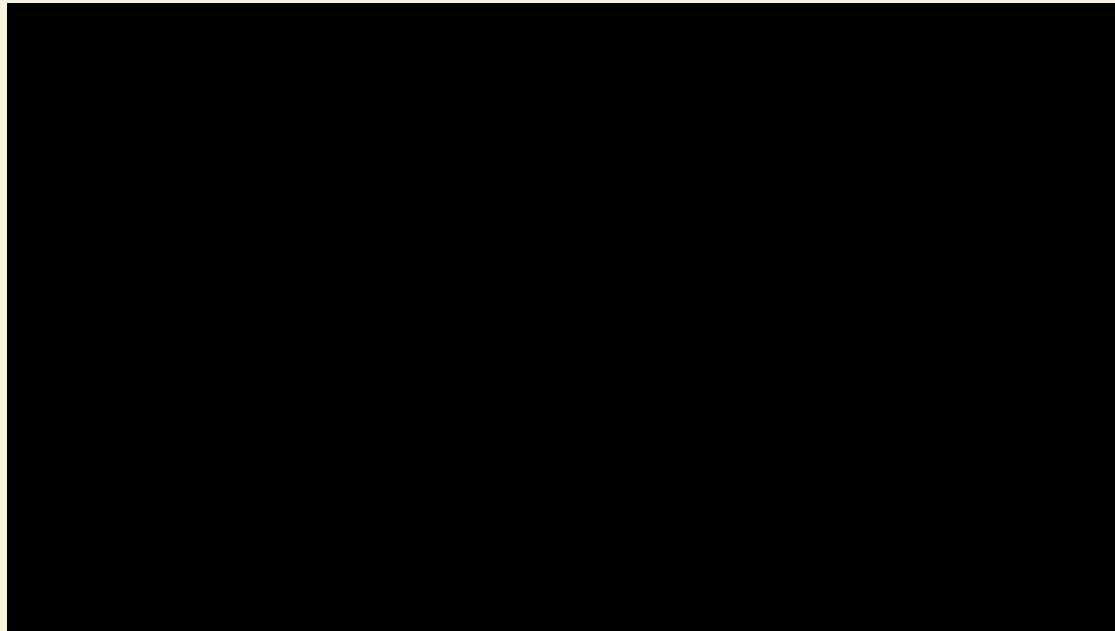
Digital twins drive the business impact of the Internet of Things (IoT) by offering a powerful way to monitor and control assets and processes



<https://www.gartner.com/newsroom/id/3812063>
<https://www.idc.com/getdoc.jsp?containerId=US43193617>
<https://www.gartner.com/smarterwithgartner/prepare-for-the-impact-of-digital-twins/>

ANWENDUNGEN / TOOLS

VIRTUAL CAR - VW



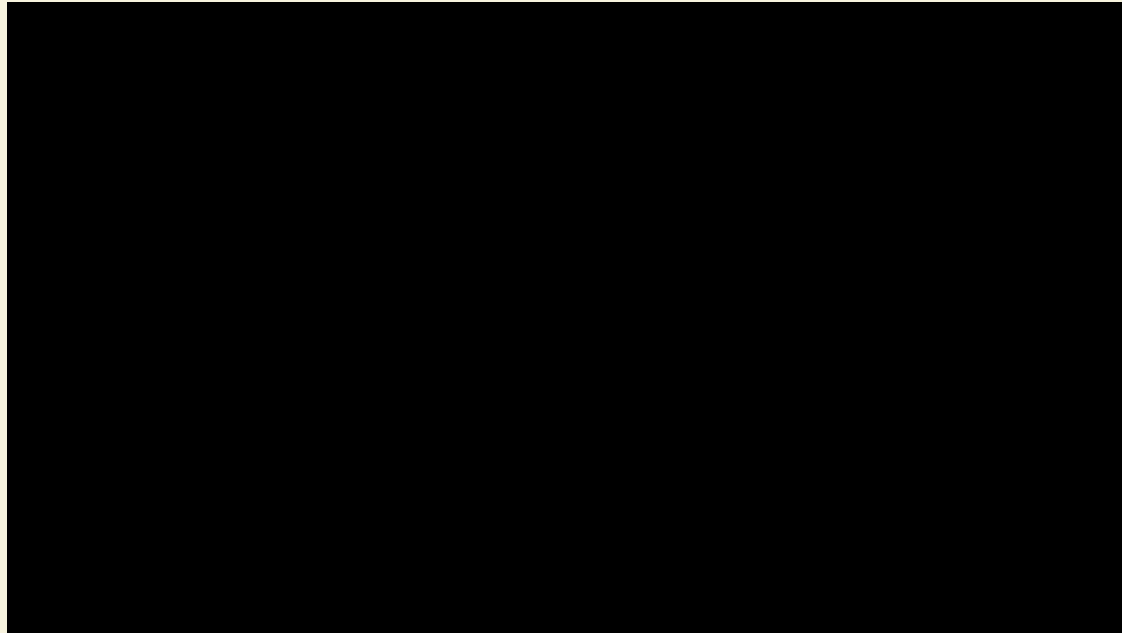
Artikel

SWIM AI

Live Traffic Online:

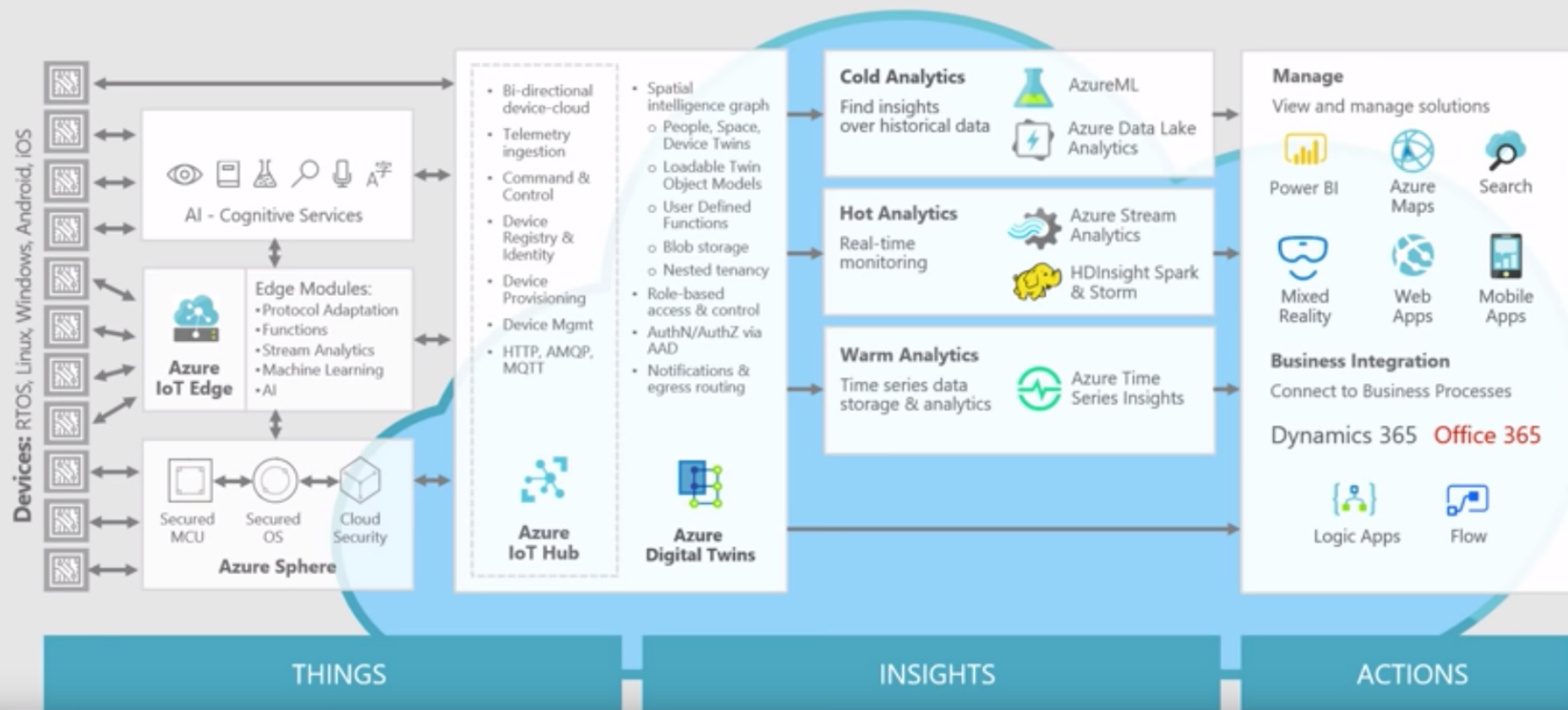
<https://www.swim.ai/showcase/traffic/>

AZURE DIGITAL TWINS SERVICE



- https://www.youtube.com/watch?v=TvN_NxpgyzQ
- <https://azure.microsoft.com/en-us/services/digital-twins/>

MODEL & INTERACT WITH THE REAL WORLD



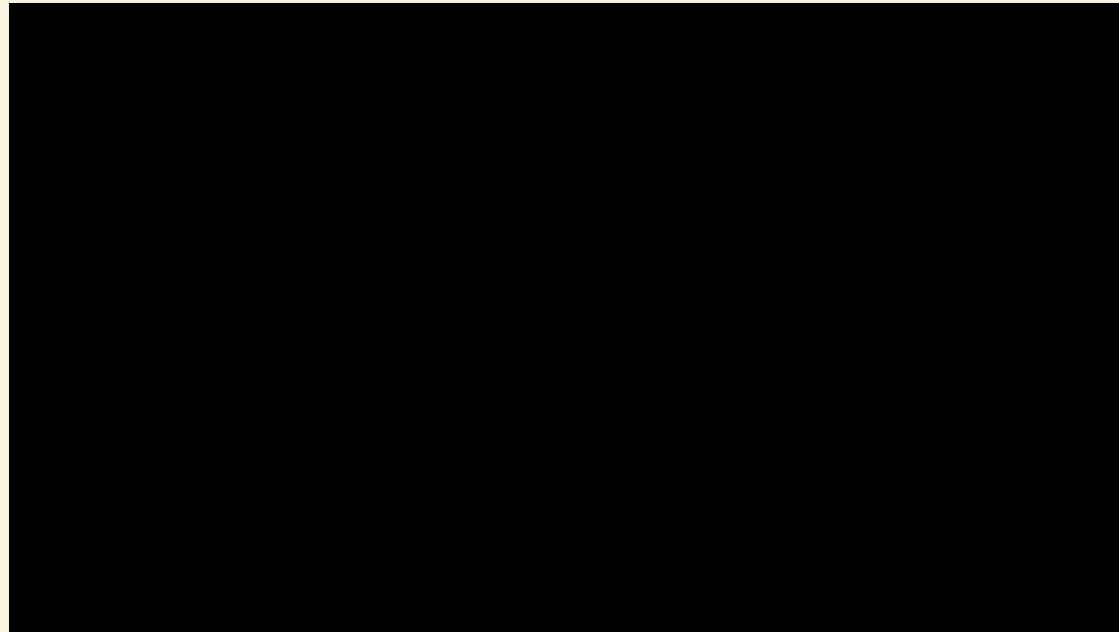
SOFTWARE AG (DARMSTADT)



ENTERPRISE DIGITAL TWIN: INNOVATING
EXCELLENCE

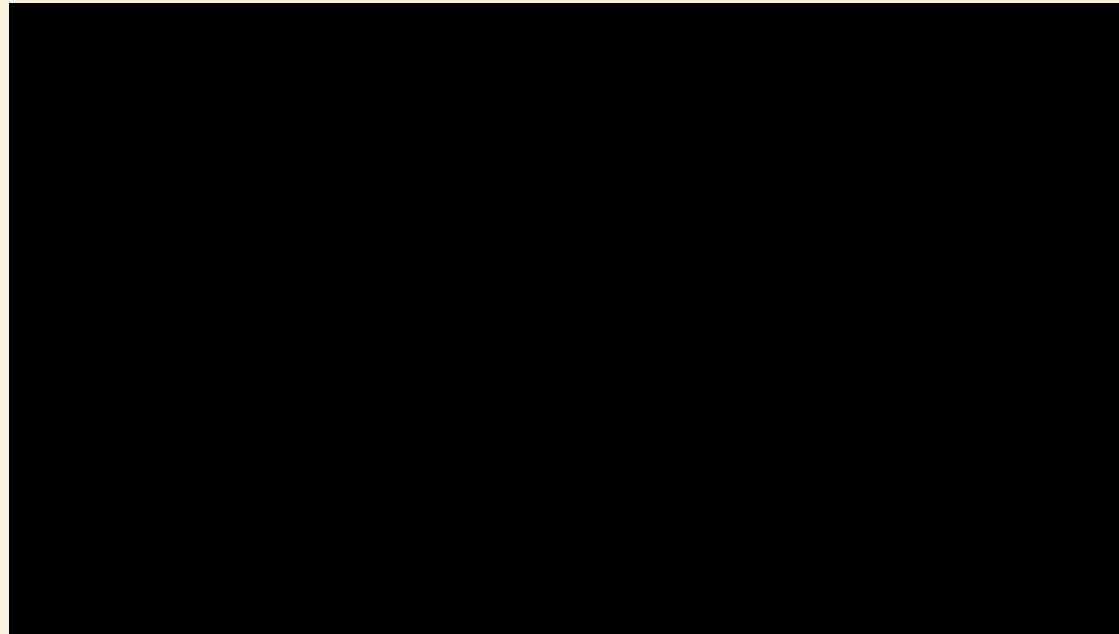
DT @ Software AG

CAMPANA & SCHOTT (FRANKFURT AM MAIN)



WORLDINSIGHT (DB IMMERSIVE TECHNOLOGY - EVE_DBs)

EVE Studio VR/MR creator suite



<https://digitalspirit.dbsystel.de/die-wirklichkeit-zum-greifen-nahe/>

MEETUP

Mittwoch, 23. Mai 2018 18:00 bis 21:00

<https://www.meetup.com/de-DE/IoT-Hessen/events/248886802/>

3D SCANNING & ASSET MANAGEMENT

- <https://www.instructables.com/id/3d-Scan-Anything-Using-Just-a-Camera/>
- <https://www.aniwaa.com/best-3d-scanning-apps-smartphones/>
- Scandy Pro
- Scanning 3d Object with iOS App
- <https://www.youtube.com/watch?v=YizMalWigkl>
- <https://www.youtube.com/watch?v=hrkkMzDUtvE>

SOURCES

- <https://www.allerin.com/blog/applications-of-digital-twin>
- https://twitter.com/EVE_DBS/status/1103301618408
- <https://digitalspirit.dbsystel.de/>
- <https://www.produktion.de/smartproducts/warum-die-verfahren-digital-twins-die-zukunft-gehoert-223.html>

SMARTENERGY

- *Consumer App um dynamisch & in Echtzeit Stromverbrauch im Haushalt zu messen und den Stromtarif anzupassen*
- *ML für Stromverbrauch zuhause*
- *Smart Netz "Retrofit"*
- *Urlaubsschaltung*
- *Smart Energy im Smart Home über AI + Analytics*
Management, Niedrigenergiehaus, Umwelthipster

SMAPPEE



<https://www.smappee.com/de/homepage> Smappee
Energy Monitor 2.0

- Echtzeitproduktion und -verbrauch.
- Strom, Solar, Gas und Wasser analysieren.

SENSE



https://youtu.be/zljzH7_c82o?t=98

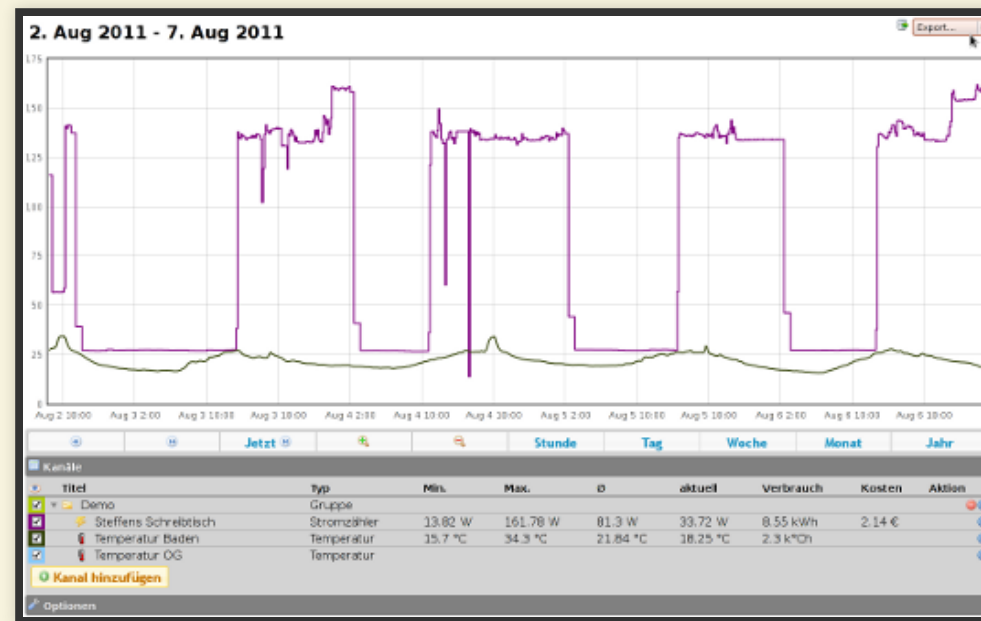
<https://sense.com/product.html>

<https://itunes.apple.com/de/app/sense-home-energy-monitor/id1024626982?mt=8&ign-mpt=uo%3D4>

APPS

- Energy Cost Calculator
- Energy Consumption Analyzer
- <https://ihaus.com/en/app/electric-meter>
- <https://smallbiztrends.com/2017/08/mobile-apps-to-help-you-reduce-energy-costs.html>

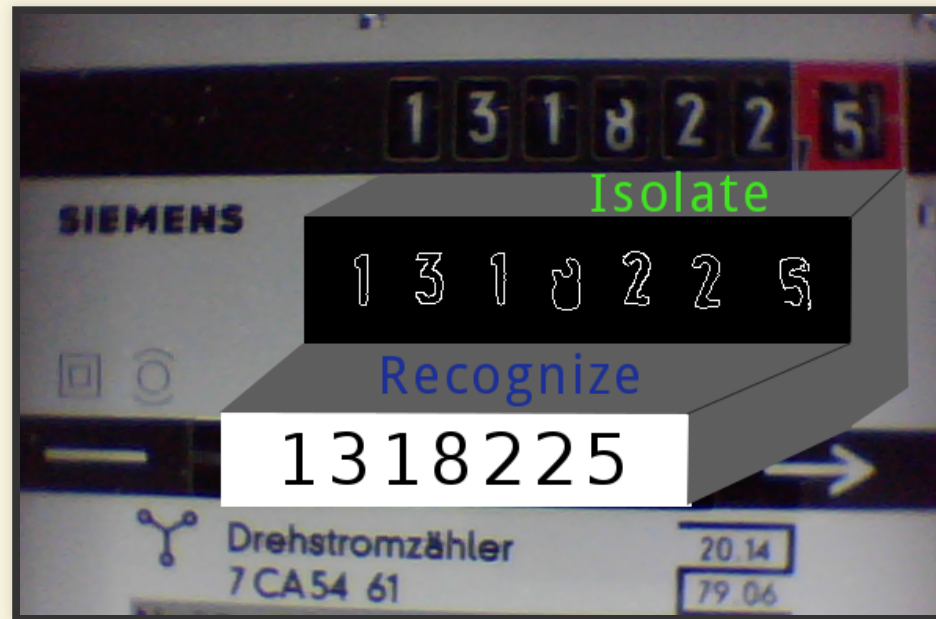
VOLKSZÄHLER



ist ein freies Smart Meter im Selbstbau. Der Nutzer behält dabei die vollständige Kontrolle über die anfallenden Strom, Wasser & Gaskosten.

<https://volkszaehler.org/>

OCR FOR DEN STROMZÄHLER



<https://www.kompf.de/cplus/emeocv.html>

<https://github.com/skaringa/emeocv>

DANKE FÜRS ZUHÖREN
FRAGEN?