

# MATTHEW LOWE Co-founder & CEO

- 15+ years software dev.
- 5 years head of IT (NA) of Wilo (\$2b global rev.)
- 7 years product R&D & PM
- University of Calgary



Native Calgarian with a passion for tech and entrepreneurship. As the original inventor behind ZeroKey's Smart Space technology, Matt holds over 22 patents, and is responsible for taking a back-of-the-napkin idea and building it into a rapidly scaling tech company. Prior to founding ZeroKey, Matt worked as the head of IT (North American subsidiaries) of Wilo, a major manufacturing company with global revenue of over \$2 billion USD. Over the course of a 15+ year career in the tech industry, Matt has contributed to several mega projects including Linux and Arduino. Linux is used by over 2 billion devices worldwide including all Android smartphones, and Arduino is the preeminent electronics prototyping platform.

## **ABOUT** ZEROKEY

- Calgary-based
- Indoor positioning tech startup
- Rapidly growing
- 10x growth in 2019, continued into 2020
- New 20,000 sq. ft. facility
- Growing from 30 to 60 staff in the next 12 months



**Dr. Guojiang Gao** 



**Dr. Chris Leskiw** 



Changhai Li



Dr. Sherif Abdelkader Dave McNab











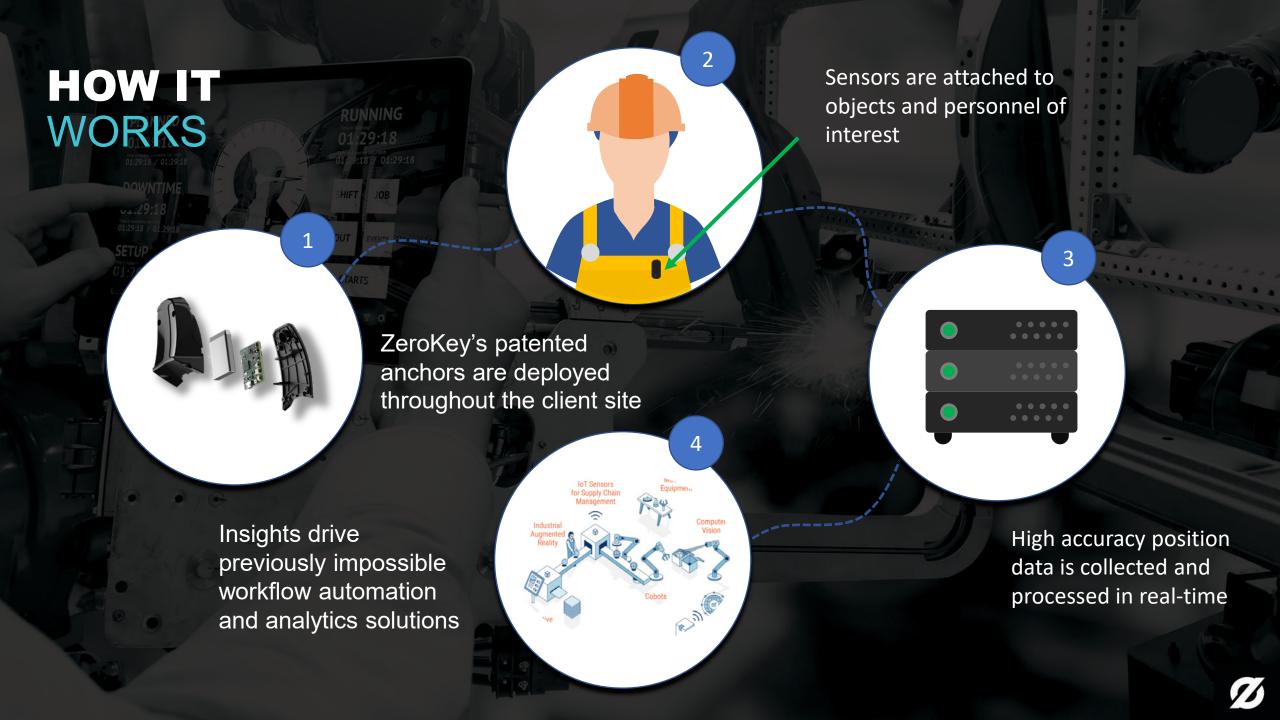


### INTRODUCING

### SMART SPACE TECHNOLOGY

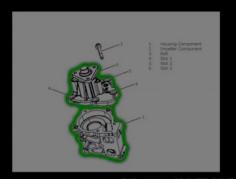
- ▶ Breakthrough 3D track & trace tech
- Ultrasonic-based sensors
- Millimetre-level accuracy
- Wide-area scalability
- ► Real-time 3D tracking (RTLS)
- Extensive IP 22 patents globally





#### **Workflow Tracker**

- Place the IMPELLER component of the pump onto the HOUSING component in the proper orientation
- 2. Grab a BOLT from BIN 3







### **USE CASE 1 HEALTH & SAFETY**



#### **Problem**

Despite sophisticated modern techbased solutions, injuries and deaths are regular occurrences in industrial environments.



#### Solution



ZeroKey Smart Space is deployed across target facilities and tracker tags are carried by workers during their normal activities.



#### **Outcome**

ZeroKey's Smart Space tags proactively notify employees if they are entering a dangerous or prohibited location.

# USE CASE 2 MANUFACTURING



#### **Problem**

A large manufacturer experiences high error rates in their assembly processes due to the complexity of their products and stringent compliance requirements



#### Solution

ZeroKey wristbands are utilized to digitally track the wrists of the assembly line worker and enable digital workflow monitoring, automated compliance reports, and real-time quality-control



#### **Outcome**

Assembly errors are dramatically reduced and data of the production environment leads to targeted data driven optimization of production processes.

# USE CASE 3 AGV'S & FORKLIFTS



#### **Problem**

A major automotive OEM makes use of Automated Guided Vehicles (AGV's) in their production environment. Changes to AGV routes requires shutdown of the plant to rework guide strips.



#### Solution

ZeroKey sensors are deployed on the AGV's to replace the magnetic strip based navigation system. Navigation routes are updated digitally without any down-time to the production facility.



#### **Outcome**



Expensive plant shutdowns are eliminated and AGV's are monitored in real-time from a centralized dashboard. Captured data is used to drive analytics-based optimization.

# USE CASE 1 SCM & LOGISTICS



#### **Problem**

Due to supply chain inefficiencies, major distributors are experience an eroding bottom line in the face of increased competition from large vertically integrated companies (e.g. Amazon).



#### Solution



ZeroKey Smart Space technology paired with Google Glass heads-up displays eliminates inefficiencies by leveraging guided "just-in-time" picking processes with digital path routing.

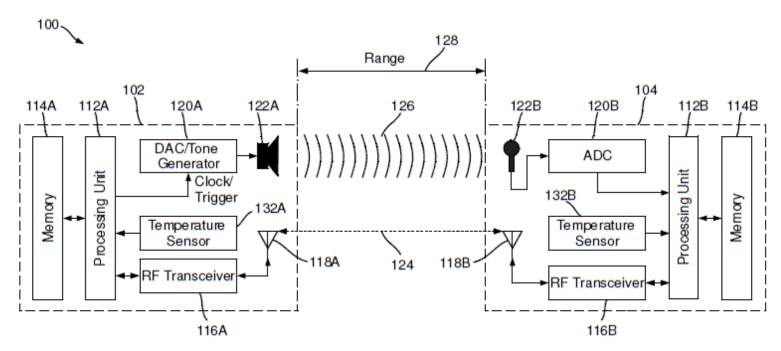
#### **Outcome**



Picks per hour by manual pick staff is increased by 35%, order latency is reduced by 30%, and the training cost of new staff is reduced by 90%.

### **Core Technology**

- Acoustic + RF = point to point ranging  $r = \frac{c_{rf}c_a\Delta t}{c_{rf} c_a}$
- Multiple ranges -> true range multilateration
- Some secret sauce involved







Source: US 10/051,599 - https://patents.google.com/patent/US10051599B2/

# ZeroKey Accuracy Test



### **Core** Technology

### Structure

- Anchors act like GNSS satellites
- Many of the same principles apply
- Infinitely expandable
- Mesh networking data layer

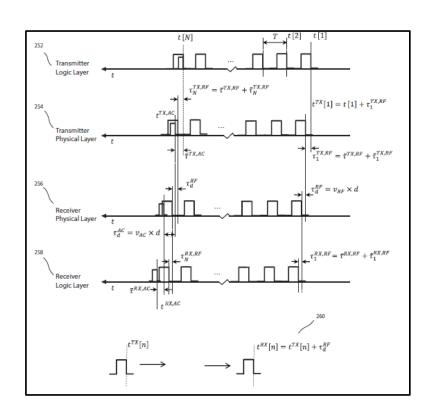
### **Timing**

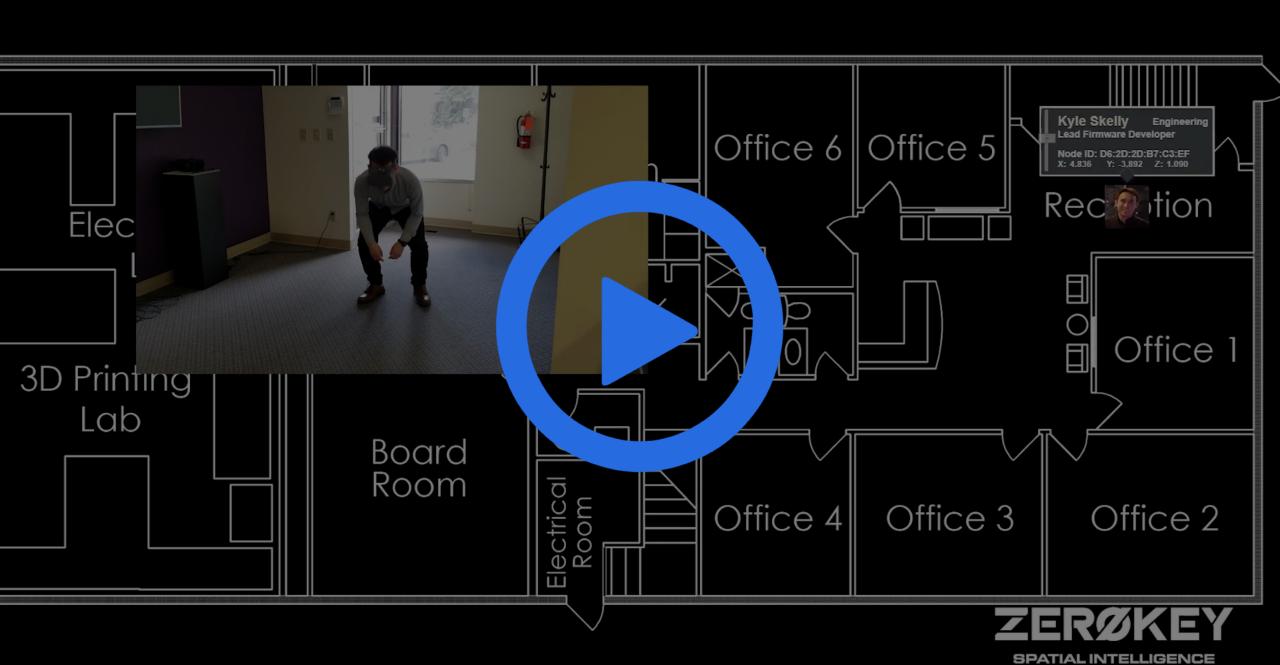
- As with GNSS, timing is important
- Requires accounting for several sources of signaling latency
- Most sources are deterministic with low noise
- Acoustic signal propagation speed is slow, so noise has minimal impact



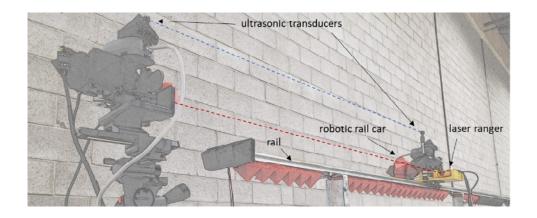


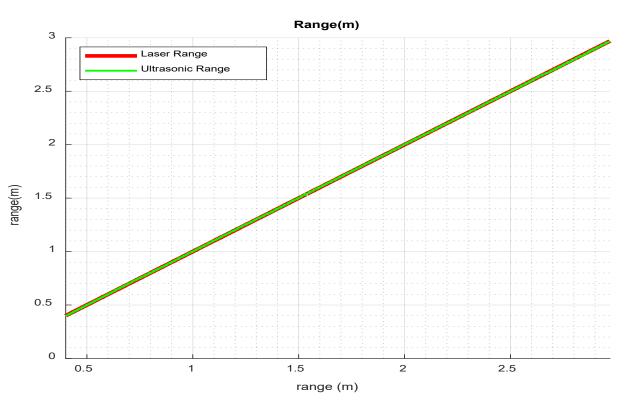


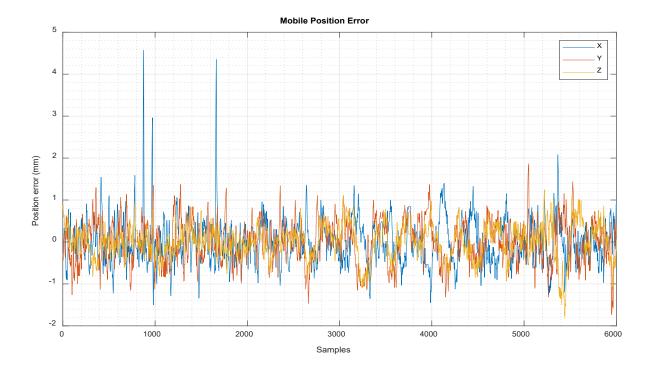


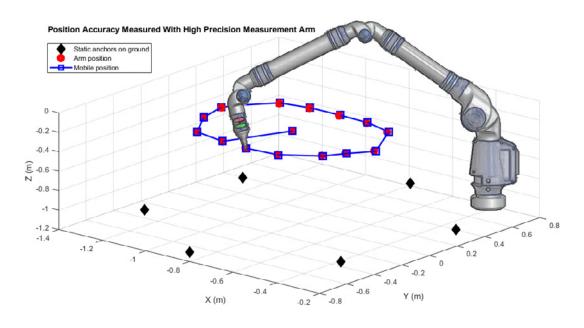




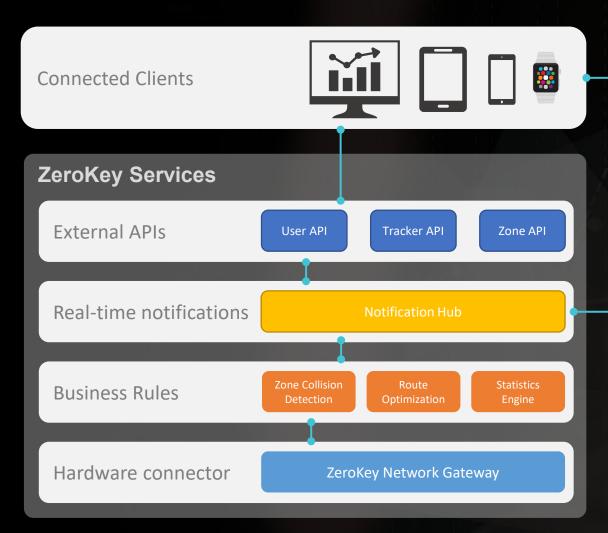


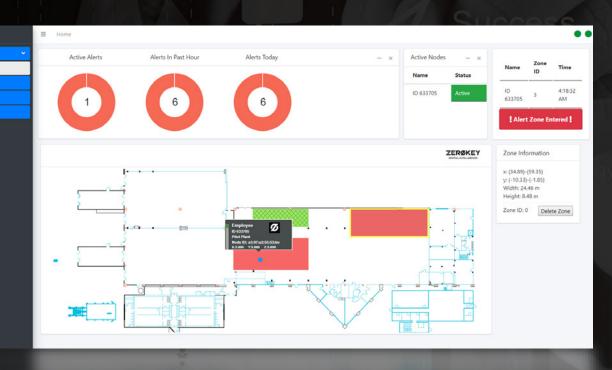






# **ZEROKEY**PLATFORM





External Systems

**Ø** ZeroKey

ACME Factory

Branding
Solution
Marketing
Analysis
Ideas
Success
Managemer

# Why we really need mm-positioning









