



ULTRASOUND NEEDLE NAVIGATION SYSTEMS WITH

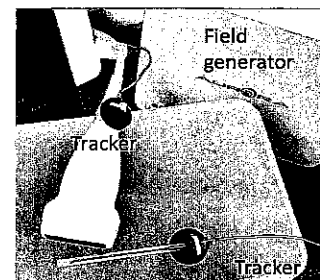
PI : Prof. HSIEH, CHENG-YUAN

Department of Anesthesiology, National Taiwan University Hospital, National Taiwan U.

Experience: Ph.D. Program in Biomedical Electronics and Bioinformatics, College of Electrical Engineering and Computer Science, National Taiwan University

Market Needs:

Ultrasound is predominantly used in clinical settings for procedures involving needle insertion or preparation. A major clinical pain point is the **difficulty in visualizing the needle tip during insertion under ultrasound guidance**, which frequently leads to inaccuracies and procedural complications.



Current solutions include **basic needle guides (consumables)** and **navigation systems**. However, **approximately 90% of ultrasound systems still lack any form of needle assistance**. Among the remaining 5–9%, the most commonly used device is the traditional **needle guide**, a market valued at **USD 330 million** with a **CAGR of 5.9%**. Although introduced over 30 years ago, the needle guide has **not become a standard of care** due to several limitations:

- **Restricted operator freedom of movement**
- **Weak needle tip visibility**
- **Requirement for proprietary consumables and system-specific configurations**

The needle guide functions as a mechanical accessory that **fixes the needle trajectory along the 2D imaging plane**, but it **significantly disrupts sterile workflow**, limits the operator's ability to maneuver the ultrasound probe to identify target structures, and restricts freedom in adjusting the insertion path to avoid vessels or nerves. Because of these drawbacks, the device is often **avoided unless absolutely necessary**.

Consequently, the market has seen the emergence of **numerous high-cost competing solutions**, all attempting to overcome the inherent limitations of the traditional needle guide.

Our Technology:

Over 98% of ultrasound machines currently in use are “navigation orphans”, lacking needle navigation functionality and thus posing a higher risk of procedural complications.

Fewer than 2% of systems are equipped with dedicated needle navigation solutions, which are typically brand-locked, probe-specific, and cost-prohibitive, leading to low adoption rates.

The Uni-EM system introduces a first-and-only-in-class solution through a combination of AI algorithms and electromagnetic tracking hardware. This allows for a universal navigation system that is:

Compatible with all major ultrasound brands, probes, and needle types

Independent of proprietary configurations

Designed to achieve high precision through artificial intelligence

Key AI innovations include: Needle segmentation neural network Transformation matrix search neural network

Strength: Uni-EM is currently the only solution on the market compatible with the 98% of “navigation-orphan” ultrasound systems, offering a completely differentiated position from existing competitors. Its cost-efficiency through scalable deployment allows for a competitive B2B pricing of approximately NTD 700,000.

By integrating AI-based calibration and patented technologies, Uni-EM achieves true cross-platform compatibility, further enhancing needle insertion accuracy. Core innovations include:

A needle shadow segmentation neural network .A transformation matrix search neural network

Competing Products:

Philips PercuNav(Predicate)

Intellectual Properties:

- (Taiwan ROC) – Ultrasound Needle Navigation System with Adaptive Derivation for Two Unknown Transformation Matrices(Patent Application No. 113140546) – Under review
- (United States Provisional Application) – ULTRASOUND NEEDLE NAVIGATION SYSTEMS WITH ADAPTIVE DERIVATION FOR TWO UNKNOWN TRANSFORMATION MATRICES(U.S. Application No. 63/711,354) – Pending

Contact (do not need to fill out):
Center for Industry-Academia Collaboration, NTU
Tel: 02-3366-9945, E-mail: ordiac@ntu.edu.tw

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