Real-time Data visualization Stimuli

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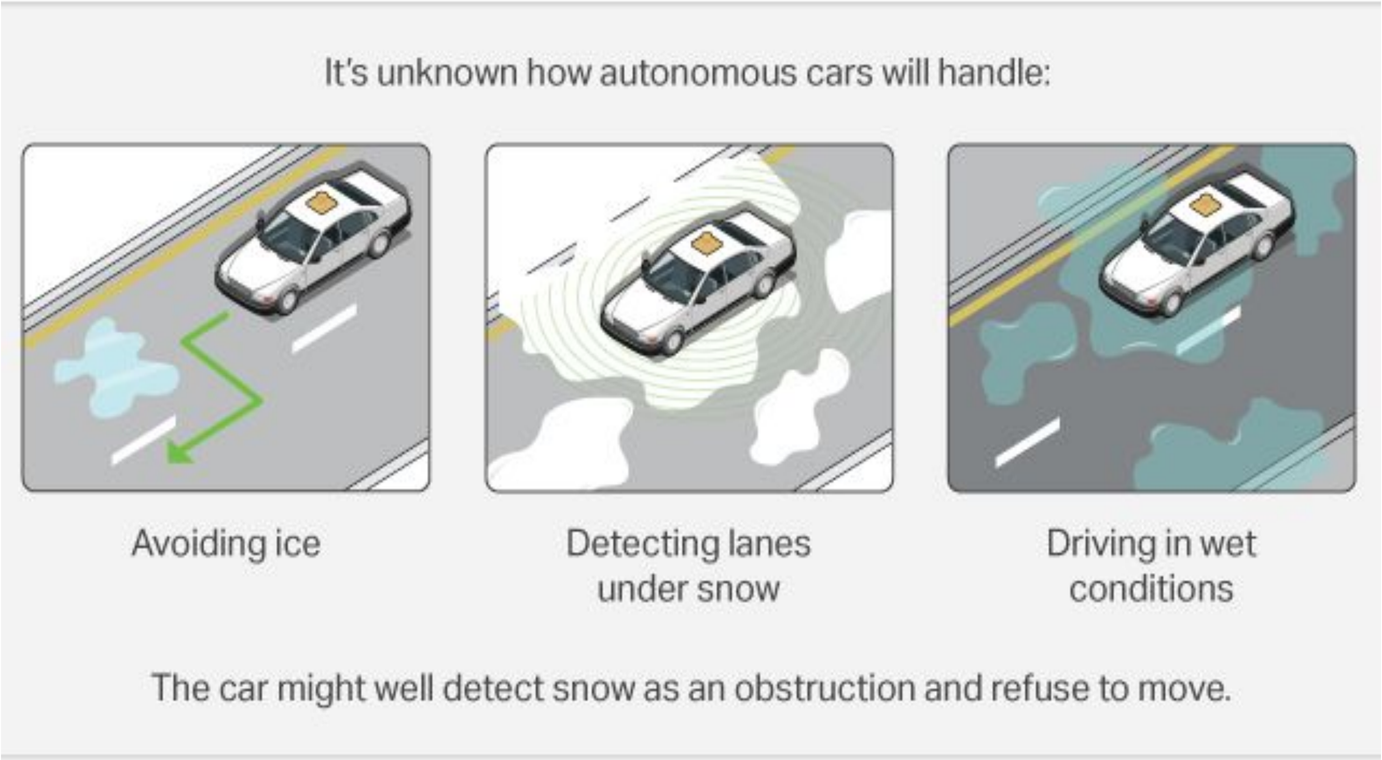
Background

- **Problems with current artificial visions**

- Accuracy issues
- Occlusions detection
- Require large labeled data
- Inefficient algorithms



Evidence:
Autonomous cars: five reasons they still aren't on our roads (McDermid, J. 2020)

- **VPN Laboratory**

According to Wall Street Journal,

Potential breakthrough ->

Novel algorithms

FINANCIAL REVIEW

Newsfeed

Technology

Print article

University of Adelaide test dragonfly neuron for artificial vision system in driverless cars

HEALTH & WELLNESS

Dragonfly Vision Helps to Build a Bionic Eye

BY RACHEL PANNETT

Sydney

What can humans learn from dragonflies?

Australian researchers have developed an artificial-intelligence system based on a dragonfly's vision that they say could help improve the eyesight of people who can see almost nothing. The system also is expected to find applications in automated technologies that rely on artificial sight, such as robots and driverless cars.

In the latest research, published in the Journal of the Royal Society Interface, scientists showed how a computer program can mimic the eyesight of a dragonfly.

Compared with humans, dragonflies have a limited ability to distinguish details and shapes of objects. But they are one of the insect kingdom's best predators because their wide field of vision and ability to detect fast movements allow them to keep track of prey even among a swarm of insects.

Researchers say the discovery could be integrated into bionic eyes, which use a retinal implant

frequently have to slow down or stop when they encounter something unexpected because sight and dexterity, along with common

ve proven difficult to into a string of com- e.

nies have long worked to the engineering chal- develop bionic eyes. One Second Sight Medical nc., of Sylmar, Calif., has approval to market its sthesis in the U.S. to tain kind of blindness. uses a video camera in a pair of eyeglasses isual input in the form transmit it to the im- electrical signal. gonfly-based visual sys- ticularly well-suited" to devices such as bionic Steven Wiederman, a ist at the University of no led the team that he motion-sensing His earlier research erting a tiny electrode nfly brain to record es involved in visual

chose to study a ather than a human se it would likely take many decades to unravel the complex human neurological system, Dr. Wiederman says. The initial project was funded by the U.S. Air Force Office of Scientific Research, he says. The more recent research involving computer modeling and robotics received funding from Australian Research Council grants.

In the current work in the Australian project, involving a test robot on wheels, the researchers are focused on the motion-detecting neurons in insect optic lobes, which transmit messages between the eyes and the brain. By replicating this in a robot, they hope to create a machine that can react to moving targets in a predictive manner.

The researchers expect the technology could someday be used in driverless cars, making them more responsive to moving objects, such as pedestrians or other cars, and helping them swerve to avoid a collision.

"If the field results are as good as simulations predict, then I envision commercial applications within five to 10 years," Dr. Wiederman says.

Turning the research into a commercial reality could still prove elusive. The current test robot is a large, ground-based vehicle because it needs to carry a computer processor big enough to simulate a biological brain. The researchers are optimistic they will be able to create a much smaller device because the insect-based algorithms are much more efficient than traditional engineering approaches. The computer program runs around 20 times faster than state-of-the-art surveillance software designed to track moving targets, Ms. Bagheri says.

"Detecting and tracking small objects against complex backgrounds is a highly challenging task," says Ms. Bagheri. "Consider a baseball player trying to take a match-winning catch in the outfield. They have seconds or less to spot the ball, track it and predict its path as it comes down against the brightly colored backdrop of excited fans in the crowd—all while running or even diving toward the point where they predict it will fall."

She says robotics engineers dream of one day creating a machine with "the combination of sharp eyes, quick reflexes and flexible muscles that allow a budding champion to master this skill."

Australian researchers have studied the dragonfly *Hemicordulia tau*, also known as the Tau emerald, to develop systems capable of helping the eyesight of blind people and making driverless cars more effective.

CLEMENT TANG/FLICKR

Drinking and Expat Culture Can Become A Problem

BY MALIA POLITZER

THE EXPAT BLOG

It took a brush with calamity for Kevin O'Grady to realize his drinking had become a problem.

Mr. O'Grady, a Canadian expat in Dubai, was at a Friday "drunch"—an all-you-can-eat-and-drink hotel buffet that was a weekly tradition for many expats there. Mr. O'Grady, an insulin-dependent, Type-1 diabetic, had a few drinks and then realized he'd forgotten his insulin and glucometer, which monitors his blood sugar level.

Had he been sober, he would have gone home immediately. But he ignored the risk, and it wasn't until he woke up the next day that the full ramifications of the risk he'd taken hit home.

Mr. O'Grady says it was during his first posting, in Ghana, that he found drinking had become central to his social life. "If someone had a rough time, we'd rally around them and go for drinks." Soon, 10 to 15 drinks a week was a normal part of his life.

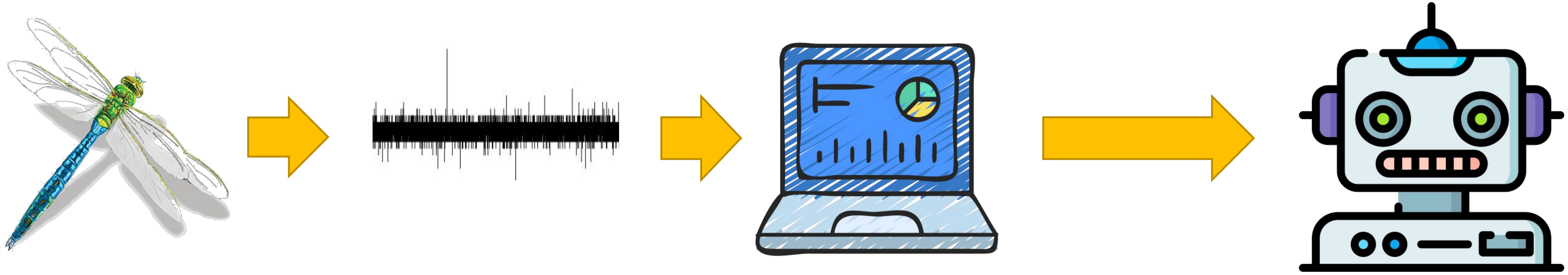
Drinking is embedded in expat culture, says Anna Sjöström, a recovery coach with Castle Craig, a large alcohol and drug rehabilitation program. "People say it's a social lubricant, but sometimes it's also social glue."

In 2011, authorities in the United Arab Emirates began offering rehab programs for expats in Dubai, after research firm Euromonitor reported a 50% rise in overall alcohol consumption in the U.A.E. from 2005 to 2010.

Ms. Sjöström is optimistic the number of rehab options will grow. "When people struggling with addiction get to meet each other and support each other, something magical happens," she says

Read the full post at the Expat blog on wsj.com, join our Facebook group or follow us @WSJexpat.

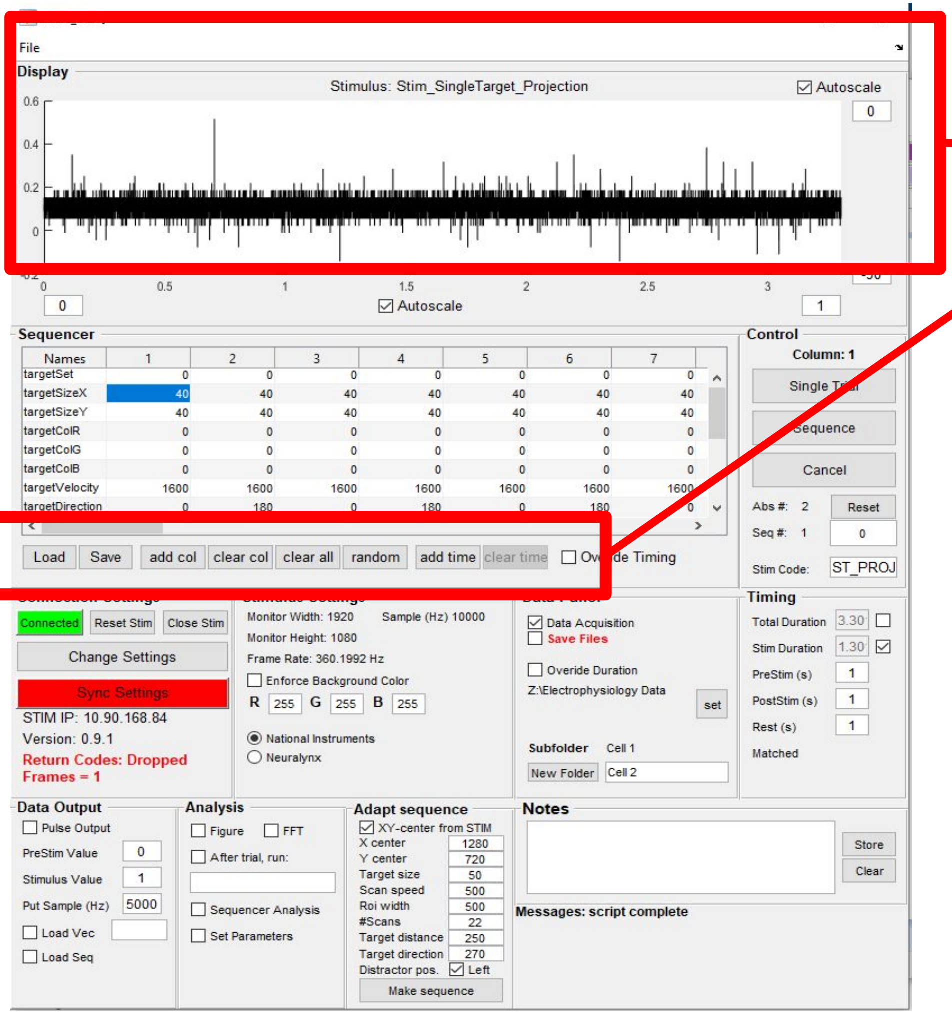
- **Existing software**



Brain recording Data analysis Model Robots/Applications

Limitation

Limitations



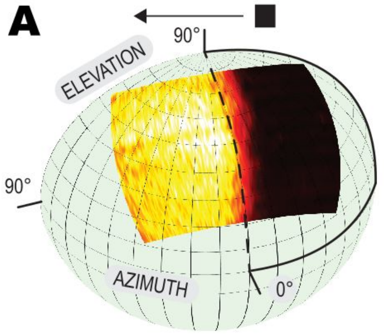
- Untimely data feedback
- Manual operation

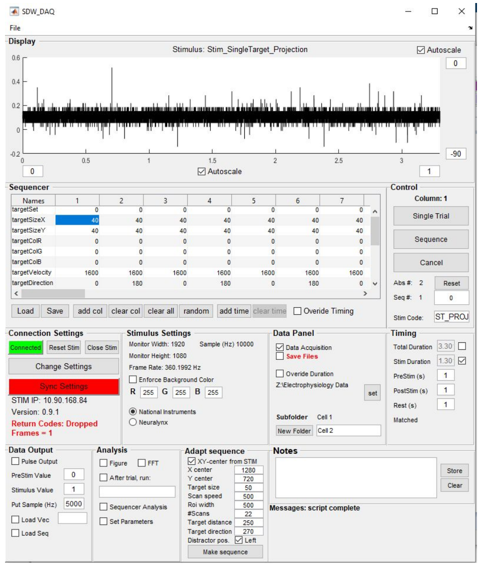
Consequence:

- Inefficient
- Unresponsive
- Unnecessary errors

Evidence:
1.9 million neurons die per minute (Saver, J.L., 2006)

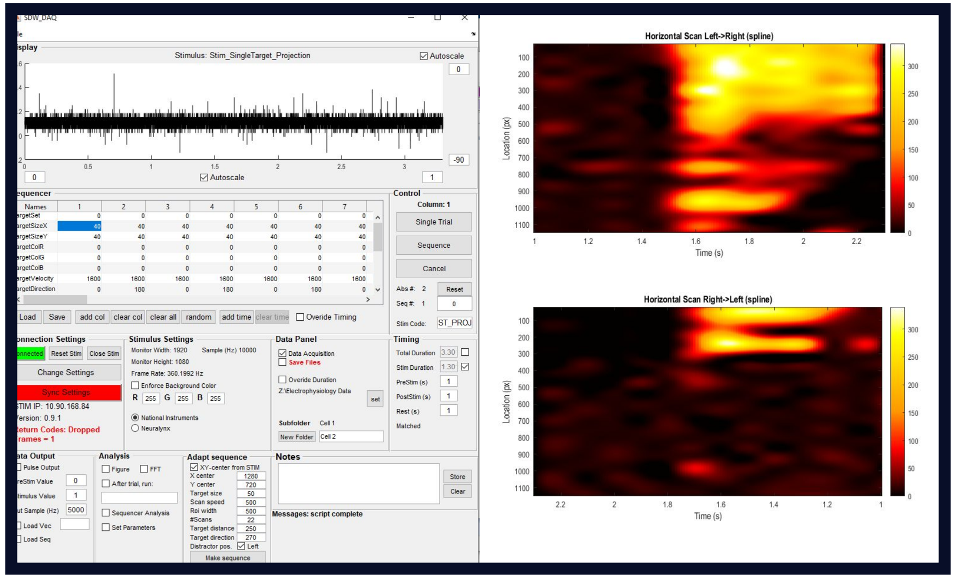
Project: Real-time Data visualization Stimuli





~~Ma ual~~

Automatic

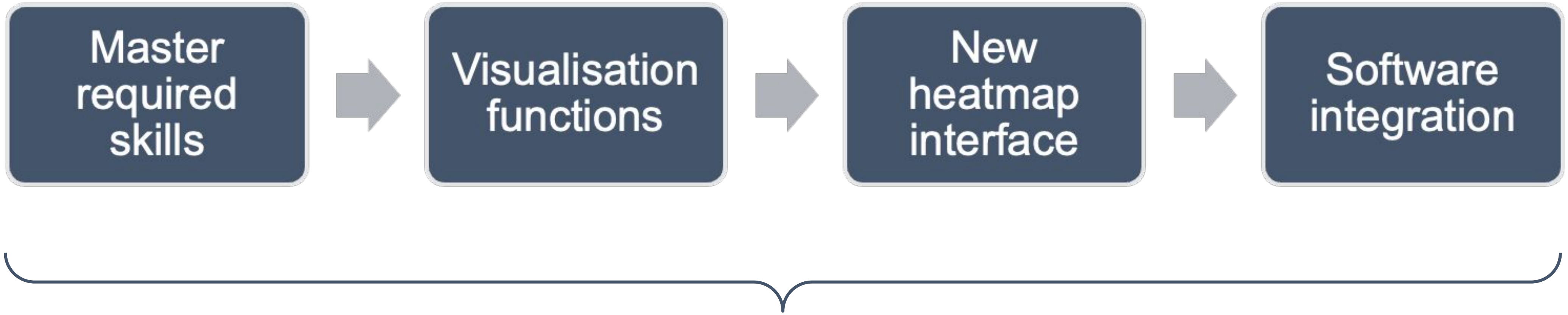


Original

Improved version

- **Why automatically ?**

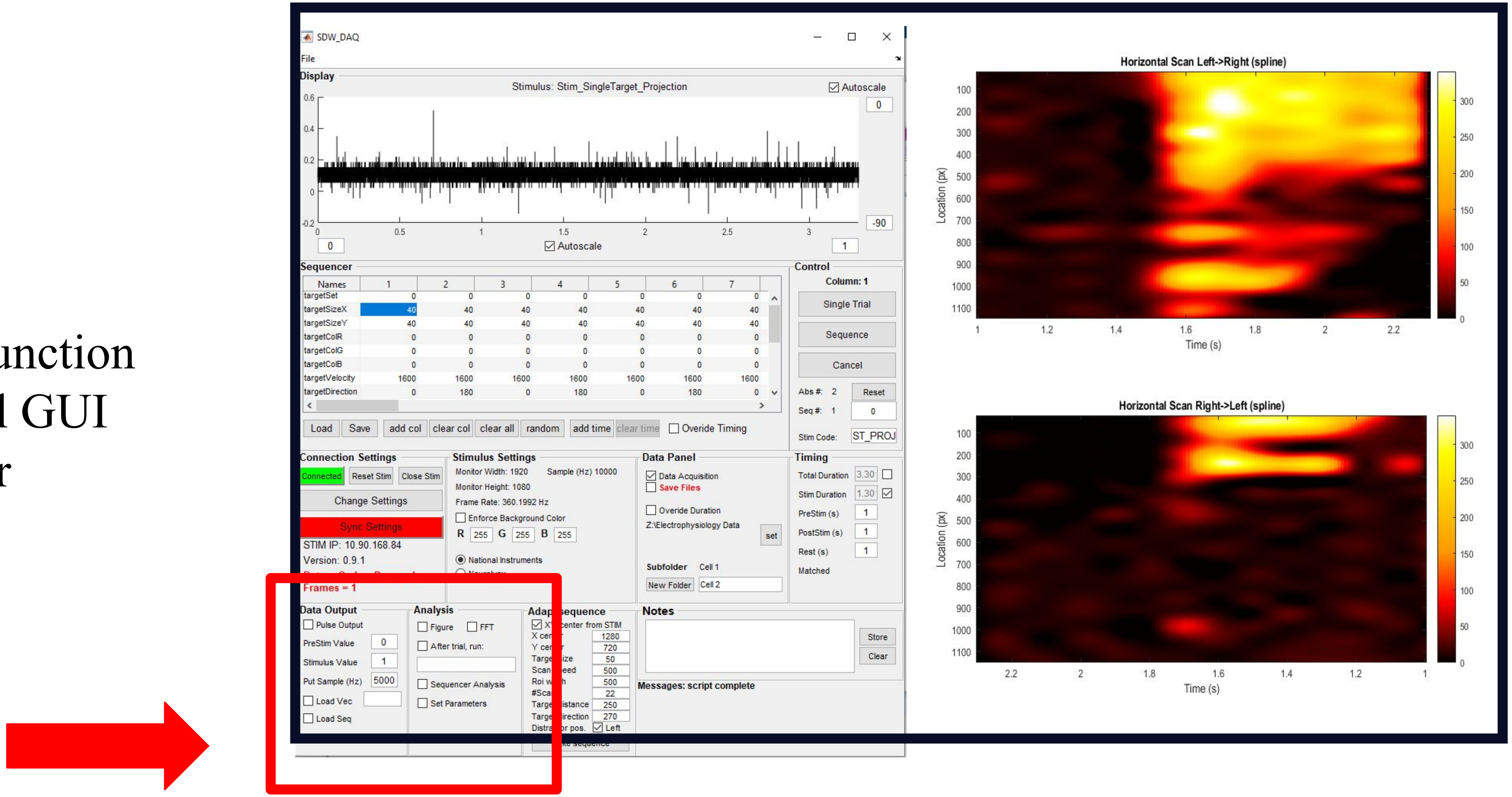
- **Feasibility**



Estimated 10 weeks

- **Extensibility**

    - Add selecting function
    - Simplify overall GUI
    - Capture monitor information



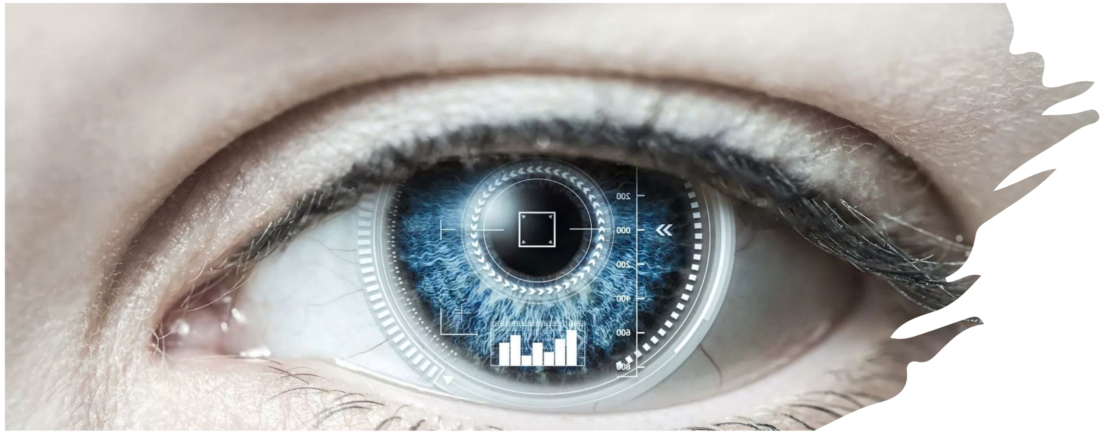
Conclusion

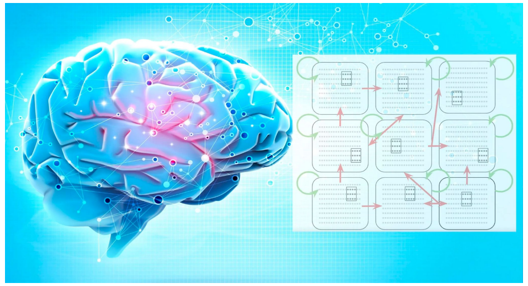
More Efficiency

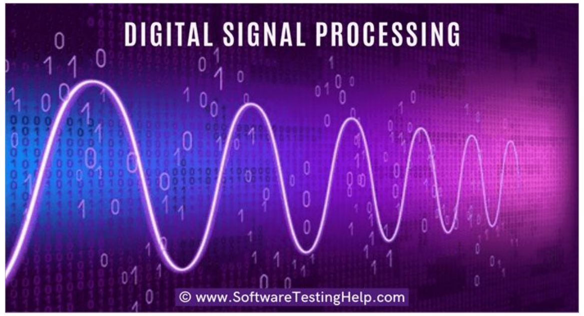
More Speed

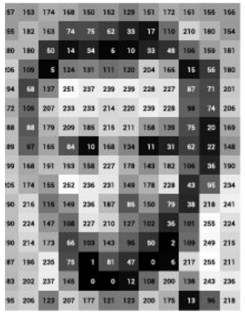
Huge Benefits

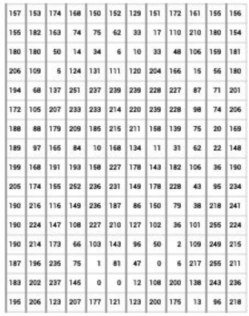
For Future











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