

# DESIGN AND IMPLEMENTATION TRACKING SYSTEM FOR CHILDREN WITH AUTISM

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# Outline...

- Introduction
- Prototype system overview
- Current status of Implementation
- Concluding Remarks
- The next steps

# Introduction

- Autism (ASD): general term used to describe a group of complex disorders of brain development.
- Difficulties in verbal and non-verbal communication and social interactions.
- Some children do not speak at all, speech usually delayed or inappropriate.
- Hyperactive and Wandering act

1 in every  
68 children in US is  
being diagnosed with  
Autism

(source:

Centre for Disease Control 2014)



9,000 children in  
Malaysia is being  
diagnosed with Autism  
every year

(source:  
*The National Autism Society of Malaysia*)



## AUTISM & WANDERING

Similar to wandering behaviors in the Alzheimer's community, wandering children and adults with autism have led to countless tragedies across the country.

In 2011, a study conducted by the Interactive Autism Network through the Kennedy Krieger Institute found that roughly half, or **49%, of children with autism attempt to elope** from a safe environment, a rate nearly four times higher than their unaffected siblings.

It also found that **more than one third of children with autism who wander/elope are never or rarely able to communicate their name, address, or phone number.** Two in three parents of elopers reported their missing children had a "close call" with a traffic injury. Thirty-two percent of parents reported a "close call" with a possible drowning. Wandering was also ranked among the most stressful autism behaviors by 58% of parents of elopers. Half of families with elopers report they had never received advice or guidance about elopement from a professional.

According to the National Autism Association, in 2009, 2010, and 2011, accidental drowning accounted for 91% total U.S. deaths reported in children with autism ages 14 and younger subsequent to wandering/elopement. Sixty-eight percent of these deaths happened in a nearby pond, lake, creek or river.



# Wandering

Children with Autism are more likely to wander away from a safe environment. Many of these children have gone missing for significant periods of time.



## Of Children Who Wander



# Study Confirms: Autism Wandering Common & Scary

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A new study confirms what many parents know well: Wandering by children with autism is common, dangerous and puts tremendous stress on families.

Using parent surveys, the researchers found that nearly half of children with autism spectrum disorder (ASD) attempt to wander or bolt from a safe, supervised place. More than half of these wandering children go missing – often into dangerous situations.

Importantly, the researchers found evidence that autism-related wandering does *not* stem from inattentive parenting. It also found that half of all parents had received no help or guidance on how to deal with the problem.

The study appears online today in the journal *Pediatrics*. Autism Speaks funded the research through its support of the Interactive Autism Network (IAN), an online project bringing together families affected by autism.

AUTiSM

# Prototype system overview

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# MOSTI TRACK AUTISM

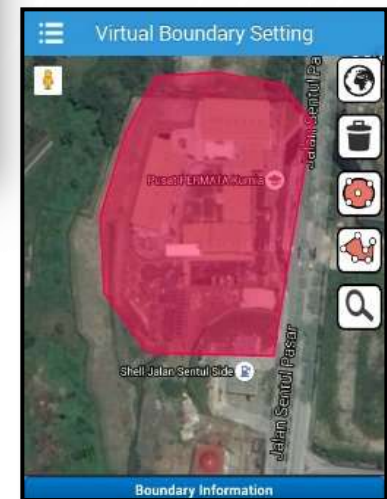
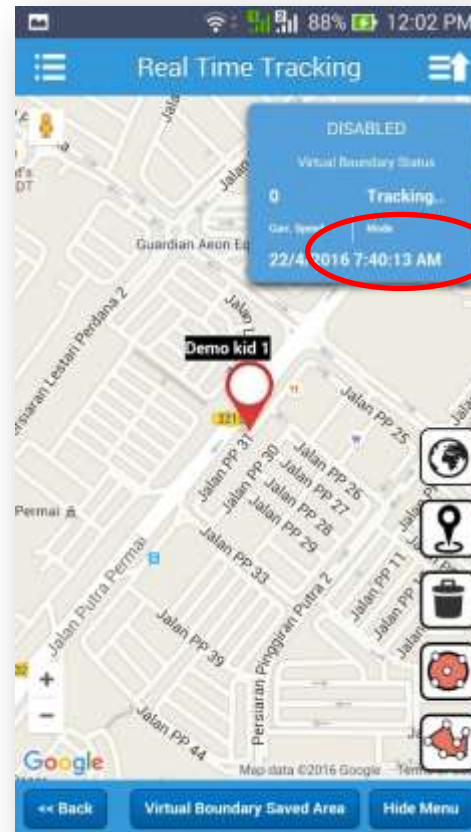
- ANGKASA has developed a prototype tracking system, tailored to fit to the needs of children with autism with the tendency of wandering.
- Incorporating of GNSS-capable device, mobile application development operating systems and web-based application.
- Monitoring children with Autism using xyz-dimension and t-dimension
- Funded by Social Innovation program under the MOSTI aims to benefit the community at the grassroots level by exploiting space technology.





# Why does it stand out from existing solutions?

- i. Mobile apps for the parents to monitor the children
- ii. setup virtual boundary of the activity zone and **time activation** according to the **schedule every single day**
- iii. Alert sent to the parents smart devices and store the history of the movement

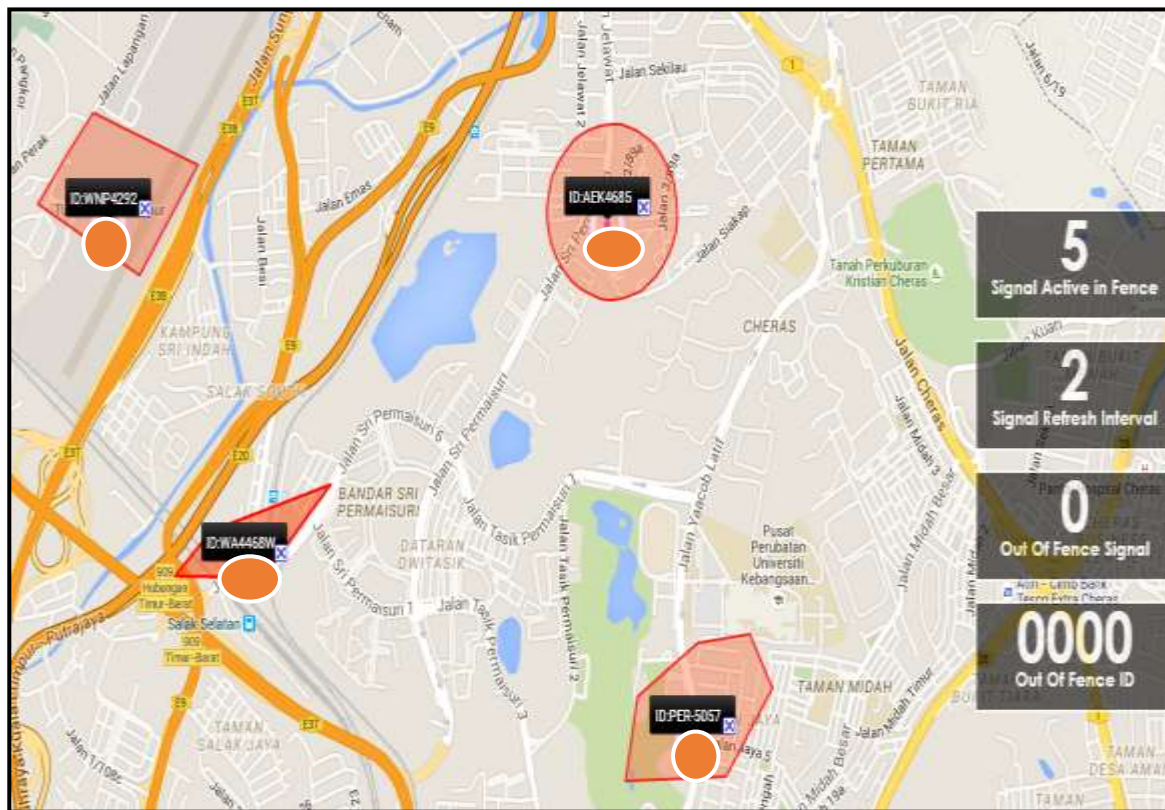




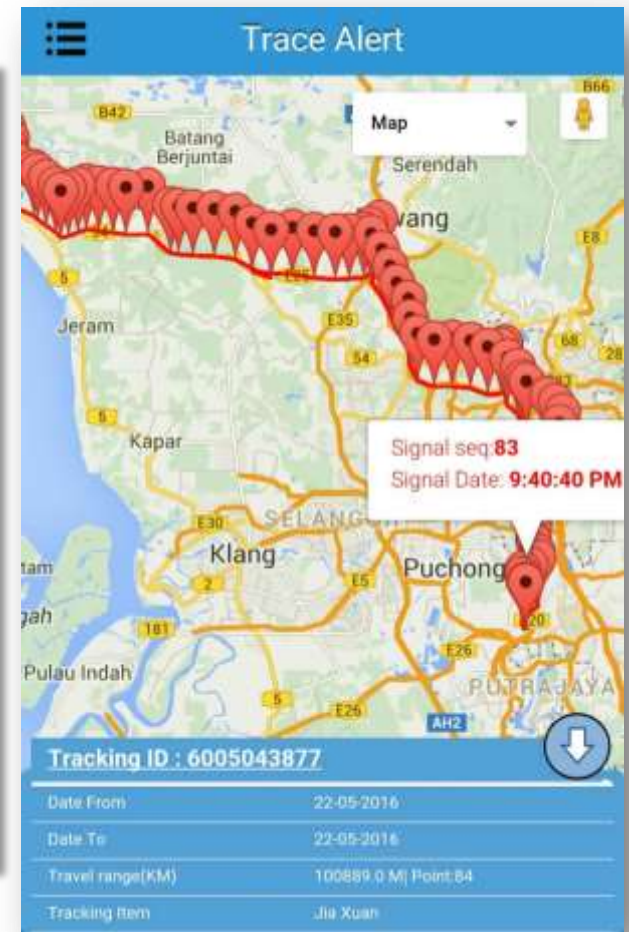
*Virtual boundary application*



- iii. Real-time **monitoring system** for autism centre to track all the children movement simultaneously.
- iv. Store the history of the movement

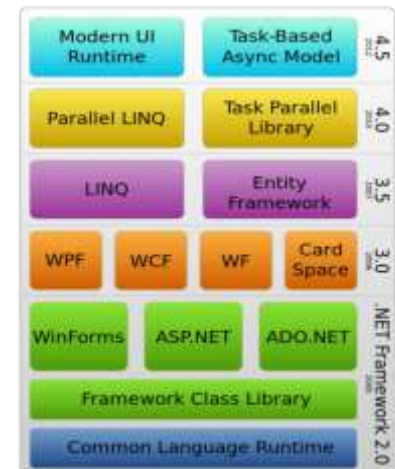


*Monitoring screen by Autism Centre*



# Web Based Application Development

Requirements	Specifications
Software	Microsoft Visual Studio 2013
Language	<ul style="list-style-type: none"> <li>• C# for running function in server side</li> <li>• Html and asp for interface design</li> <li>• java script for running function in client side</li> <li>• css file for formatting style in interface design</li> </ul>
Platform for Development	PC/Notebook
OS	Windows 7 64-Bit
Hosting for Local Web Application	Localhost
Hosting for Online Web Application	External server which provide domain IP address or web hosting
Database	MSSQL



.Net framework

# Implementation overview

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## Current status

- Prototype system being tested by collaboration with Pusat PERMATA Kurnia - National Autism Centre under Prime Minister Department.
- 40 children with autism under their care been selected for the case study
- Evaluation form been distributed to the parent in order to get the valuable feedback/suggestion.



# Concluding Remarks

- The development provides an easy, effective and reliable method for monitoring children with autism through GNSS technology.
- Reduce the risk of accident to the children with autism
- Provide contribution to medical and psychologist profession by studying the wandering/hyperactive behaviours of children with autism.
- To benefit the community at the grassroots level by space technology

# Next steps..

- Upgrading hardware for performance stability
- Additional system features : integration of outdoor and indoor positioning capabilities
- Wider applications such as Elderly, Alzheimer's patient or unfortunate group of people



**THANK YOU**

