



ISBN	978-81-929866-6-1
Website	icsscet.org
Received	25 – February – 2016
Article ID	ICSSCCET082

VOL	02
eMail	icsscet@asdf.res.in
Accepted	10 - March – 2016
eAID	ICSSCCET.2016.082

Development of Time Measuring Device using Accelerometer Synchronised with Speedometer

B SaravanManikandan¹, Charles Anto Infent F², Dhivya R³, Kavya P S⁴ & Mugesh Devi M⁵

¹Asst.Prof/ECE, ^{2,3,4,5} Final Year ECE Students, Karpagam Institute of Technology, Coimbatore

Abstract: Predicting a vehicle's estimated time of arrival while enrooting can be a challenging endeavour. In order to improve the accuracy of time of arrival the following method is used. This work presents a method for enhancing ETA predictions by applying machine learning techniques, taking into account general information about the vehicle's efficiency and diameter of the tyre, road conditions and traffic. A good amount of effort is put for the feature generation and selection and subsequently a model is built from representative vehicles efficiency, speed and distance and allowing to predicted the time of arrival with greater accuracy. On the basis, probabilistic methods for calculating the probability of main factors and ETA of various factors on the degree of influence based on Bayesian network was proposed using data mining. Calculating the time to attain the destination with the help of the velocity of the vehicle and distance to be covered.

Keywords: Arduino UNO board, ETA, SCU (System Controller Unit)

INTRODUCTION

The estimated time of arrival or ETA is a measure of when ship, vehicle, aircraft, cargo, emergency service or computer file is expected to arrive at a certain place. One of the more common uses is in public transporation where the movements of trains, buses, airplanes and the like can be used to generate estimated times of arrival depending on either a velocity, distance and the measurements on traffic intensity. On the journey towards our destination, we may not know about the time taken to reach the point of arrival. Incase of emergency situations or in scenarios of reaching the target in a given time we may not have any knowledge about the time remaining to reach the destination. In such cases we may use the distance to be travelled and the speed at which the vehicle travel, we may predict the Estimated time of Arrival. Using this technique we may reach the given target and we may have a knowledge about the time remaining, so we can attain our destination in the particular time. we use the Arduino UNO board in this technique. The UNO microcontroller board based on the ATmega328P. It has a 14 digital i/o pins.



This paper is prepared exclusively for International Conference on Systems, Science, Control, Communication, Engineering and Technology 2016 [ICSSCCET 2016] which is published by ASDF International, Registered in London, United Kingdom under the directions of the Editor-in-Chief Dr T Ramachandran and Editors Dr. Daniel James, Dr. Kokula Krishna Hari Kunasekaran and Dr. Saikishore Elangovan. Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage, and that copies bear this notice and the full citation on the first page. Copyrights for third-party components of this work must be honoured. For all other uses, contact the owner/author(s). Copyright Holder can be reached at copy@asdf.international for distribution.

2016 © Reserved by Association of Scientists, Developers and Faculties [www.ASDF.international]

Cite this article as: B SaravanManikandan, Charles Anto Infent F, Dhivya R, Kavya P S, Mugesh Devi M. "Development of Time Measuring Device using Accelerometer Synchronised with Speedometer". *International Conference on Systems, Science, Control, Communication, Engineering and Technology 2016*: 426-429. Print.

Literature Overview

Reference 1

Wang Chao and Jin lina has proposed the same system in the aircraft .With the help of this technique we are able to predict the estimated time of arrival and time taken for the aircraft to approach the approach the landing strip.

They have proposed a formula in order to

$$ETA = \quad +$$

Where,

S= distance of the air craft travelled,

V=speed of the aircraft,

T_0=time taken in order to tackle the weather conditions and air traffic.

Using this technique we can find the time taken to reach the target

Reference 2

Chun-Hsin Wu and Jan-Ming Ho have proposed the travel time pretiction with support vector regression for vehicles. Travel time is a fundamental measure in transporation. Accurate travel time prediction also is crucial to the developement of intelligent transporation system and advanced traveler information systems. They use the Historical Mean Pretiction Method,

$$y(t+l)=f(t,l,y(t),y(t-l),\dots,y(t-n))$$

This are the applicability of SVR to traffic data analysis. Travel time is the time required to traverse a link or a route between any two points of interest. Since traffic data may be missed or corrupted, we select a better portions of data set of the high way.

Methodology

In this process, we use a speed sensor which is used to calculate and detect the speed of the of the vehicle and give it as an one of the input ,the speed sensor is connected to a special type of SCU (system controller unit) with enables to provide the input to the Arduino board. An another input given to the arduino board is the distance that we are going to travel which is given through the keyboard. These two inputs are given as the input to the arduino board. The program that we dumped inside the arduino board computes the given distance and the current speed and provides the estimated time to reach the destination and it is displayed in the LCD which is connected to the arduino board. Incase if the speed is varied, the speedsensor automatically intimate the variation of the speed in the arduino board and correspondingly calculate the

ETA. Incommon we know the general releation between the speed, distance, and time.

$$ETA =$$

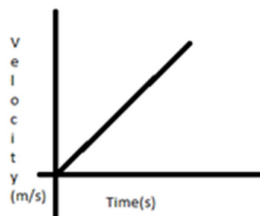
Where,

dl= distance to be travelled,

dv=speed at which the vechile is travelling

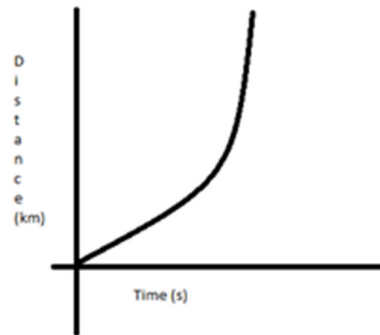
Every time when the speed is varied, the mean value of the current speed and the previous speed of the vehicle is calculated and it is taken into consideration for calculating the Estimated Time of Arrival

(a).



Cite this article as: B SaravanManikandan, Charles Anto Infent F, Dhivya R, Kavya P S, Mugesh Devi M. "Development of Time Measuring Device using Accelerometer Synchronised with Speedometer". *International Conference on Systems, Science, Control, Communication, Engineering and Technology 2016*: 426-429. Print.

(b).



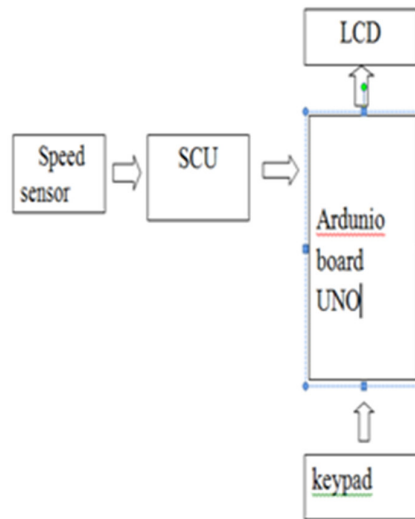
Following graphs gives the relation between the time and velocity (a) and time and distance (b). We uses special type of arduino board called ARDUINO UNO.

Analytical Report

S.NO	AUTHOR	TITLE	DRAWBACK	OVERCOMING IN CURRENT SCENARIO
1.	Wangchao, Jun lina	Research on arrival time prediction and approach sequencing based on uncertain methods	Arrival time is not accurate	ETA is accurate
2.	Christian Strottmann kern, Ivo paixao de medeiros	Data-driven aircraft estimated time of arrival prediction	Only used in aircraft	This method can be used in two wheelers and four wheelers
3.	Jan-Ming Ho, D.T.Lee	Travel-time prediction with support vector regression	SVR method is used	Simple mathematical method is used
4.	Cook, Andrew, Graham Tanner	Adaptive systems –A case for calculating estimated time of arrival	Only used in vehicle for water travel	This method used in scrambler

Cite this article as: B SaravanManikandan, Charles Anto Infent F, Dhivya R, Kavya P S, Mugesh Devi M. "Development of Time Measuring Device using Accelerometer Synchronised with Speedometer". *International Conference on Systems, Science, Control, Communication, Engineering and Technology 2016*: 426-429. Print.

Flow Chart



Conclusion and Future Work

Thus in past, time of arrival is calculated for Aircrafts and the estimated time with least accuracy is noted .This gives the knowledge of arrival of the vehicle.

In our method, we proposed the same technique in two wheelers and four wheelers to predict the time of arrival.

Thus the coding is dumped in a arduino UNO board and the device for calculating the estimated time of arrival can be found using this technique and the reference given below.

References

1. Chun-Hsin Wu, member, IEEE, Jan-Ming Ho+, member, IEEE, and D.T. Lee, Fellow. IEEE
2. Christian Storttmann Kern,Ivo Paixao de Medeiros Embraer S.A, Sao Jose dos campos ,Brazil.
3. Takashi Yoneyama, ITA- Instituto tecnologico de Aeronautica, Sao Jose dos Campos, Brazil.
4. Suzuki, Yoshiniori."The relationship between on-time performance and airline market share:a new approach." Transportation Research part E:Logistics and transportation Review 36.2(2000):139-154.
5. Cook, Andrew and Craham Tanner "Modelling the airline costs of delay propagation". AGIFORS Airline operations Conference, London, UK.2011.
6. Breiman, Leo. "Random forests". Machine learning 45.1(2001):5-32.
7. Murphy, James,et al. "Physics-based and parametric trajectory prediction performance comparsion for traffic management". AIAA Guidance, Navigation and control. 2003.
8. H.Yang, L.Chan and I.King, "support vector machine regression for volatile stock market prediction ,"in Proc.Intelligent Data Engineering and Automated Learning, H.Yin,N.Allinson, R.Freeman,J.Keane, and S.Hubbard,Eds.,2002,pp.391-396.Springer LNCS 2412.