جامعة الأمير سلطان
PRINCE SULTAN UNIVERSITY

SUSTAINABLE DEVELOPMENT REPORT 2019

Industry, Innovation and Infrastructure

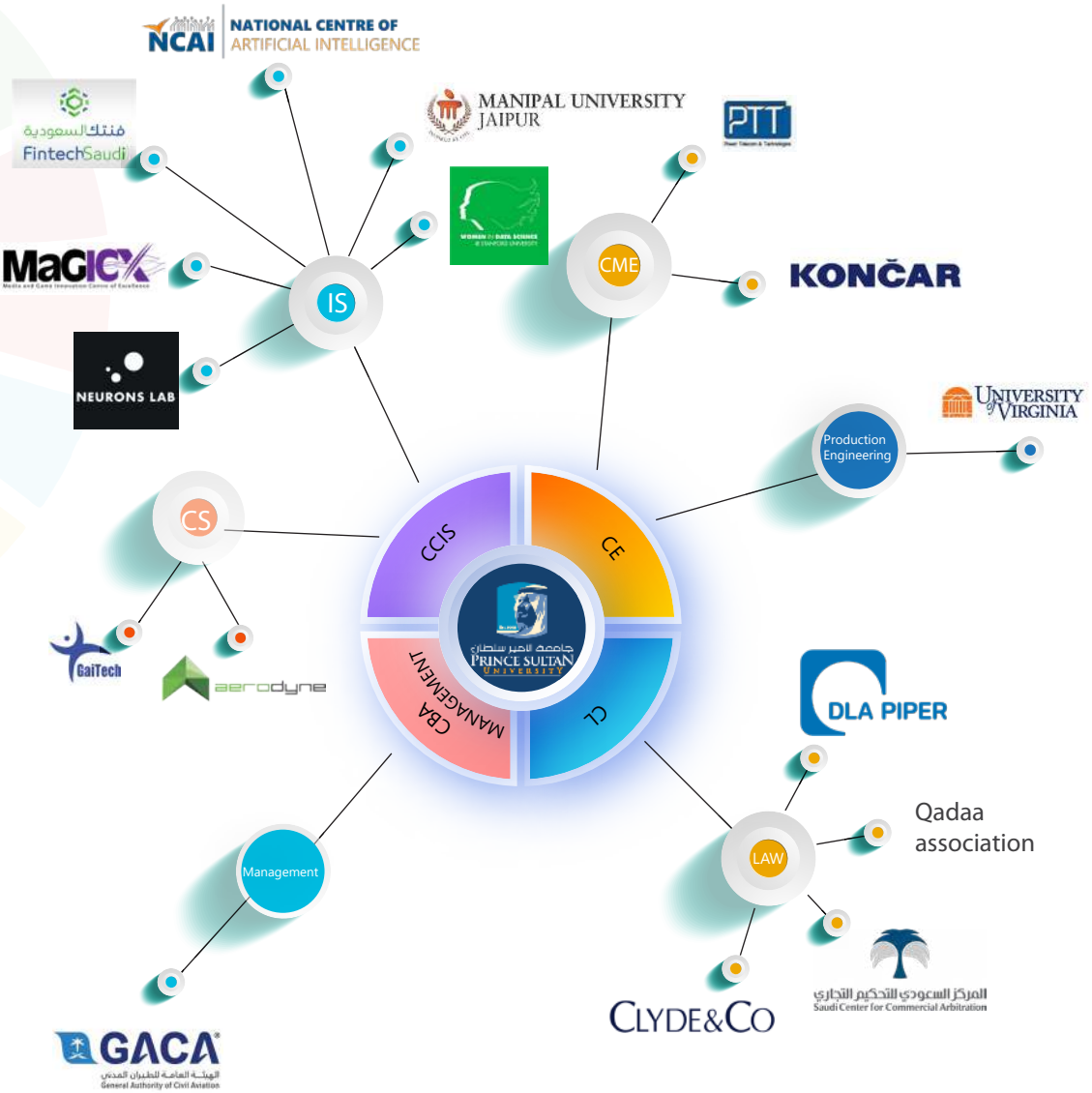
Industry, Innovation and Infrastructure

Prince Sultan University has been encouraging faculty members to establish external collaborations with academic and industrial partners. At present, there are several on-going collaborations in place to have dynamic and robust environment in the university. In addition, to support innovation, PSU has been sponsoring patent applications. With two published patents, a total of six more patents applications have been filed in collaboration with 'Oblon patent office' at the US patent office which are under evaluation.

Achievements

Collaboration with external partners

Several faculty members have established collaborations with international and local, academic and industrial partners. Currently there are 16 on-going collaborations.

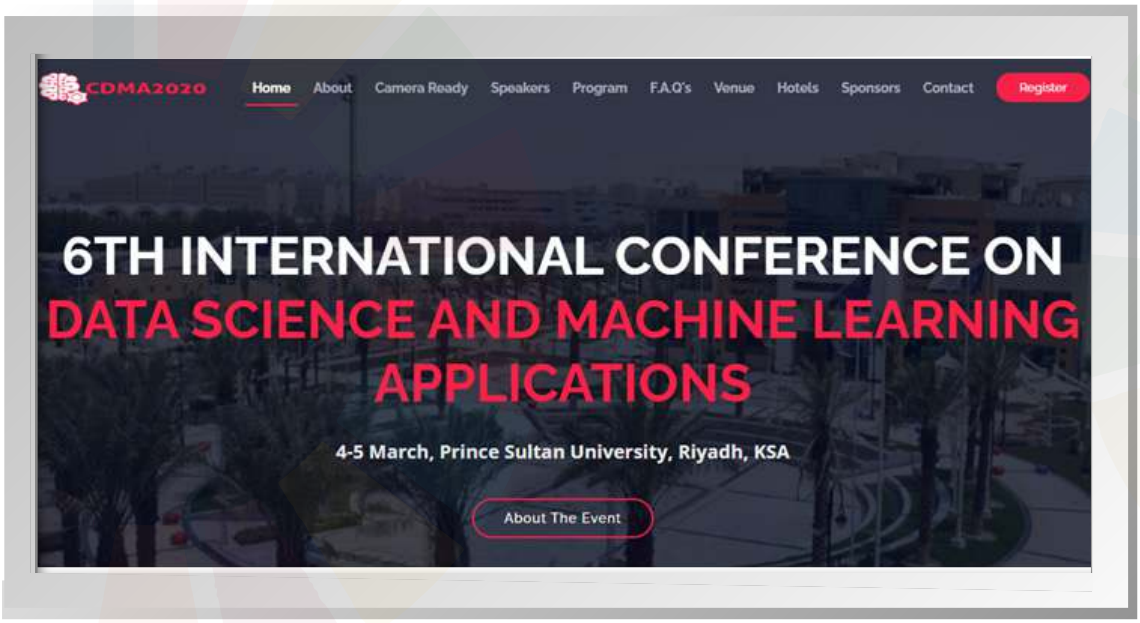


9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

CDMA2020 : The 6th International Conference on Data Science and Machine Learning Applications

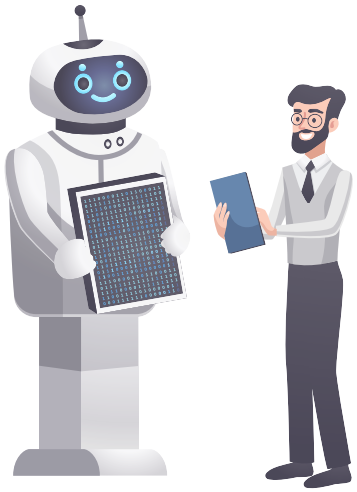
CDMA2020, the 6th edition of 'International Conference on Data Science and Machine Learning Applications' is aimed to gather researchers and Applications developers from a wide range of Data Science related areas such as data analytics, computational intelligence, machine learning, deep learning, pattern recognition, databases, Big Data and Visualization. The Conference will provide opportunities for technical collaboration among data science and machine learning researchers, developers and practitioners in Saudi Arabia, GCC countries and Middle-East region. Acceptance will be based primarily on originality, significance and quality of contribution. All submissions with undergo a blind peer review process before acceptance and possible inclusion in the proceedings of the conference.

Venue: Prince Sultan University, Riyadh, Saudi Arabia
Date : Wednesday – Thursday (4th - 5th March, 2020)



Research supported by Gaitech Robotics

PSU received research funding from Gaitech Robotics – China, for software development by the RIOTU Lab at PSU for the company.



Patents

PSU researchers were able to secure two patents based on individual efforts and collaboration with external researchers while the PSU researchers made prominent contribution in concept development and mechanisms involved.

Platoon vehicle management

US 20100256852A1

(19) **United States**

(12) **Patent Application Publication**

Mudalige

(10) **Pub. No.: US 2010/0256852 A1**

(43) **Pub. Date: Oct. 7, 2010**

(54) **PLATOON VEHICLE MANAGEMENT**

(75) Inventor: **Upali Priyantha Mudalige**, Troy, MI (US)

Correspondence Address:
CICHOSZ & CICHOSZ, PLLC
129 E. COMMERCE
MILFORD, MI 48381 (US)

(73) Assignee: **GM GLOBAL TECHNOLOGY OPERATIONS, INC.**, Detroit, MI (US)

(21) Appl. No.: **12/749,659**

(22) Filed: **Mar. 30, 2010**

Related U.S. Application Data

(60) Provisional application No. 61/167,121, filed on Apr. 6, 2009.

Publication Classification

(51) **Int. Cl.**
G05D 1/00 (2006.01)
G06F 19/00 (2006.01)

(52) **U.S. Cl.** **701/24**

(57) **ABSTRACT**

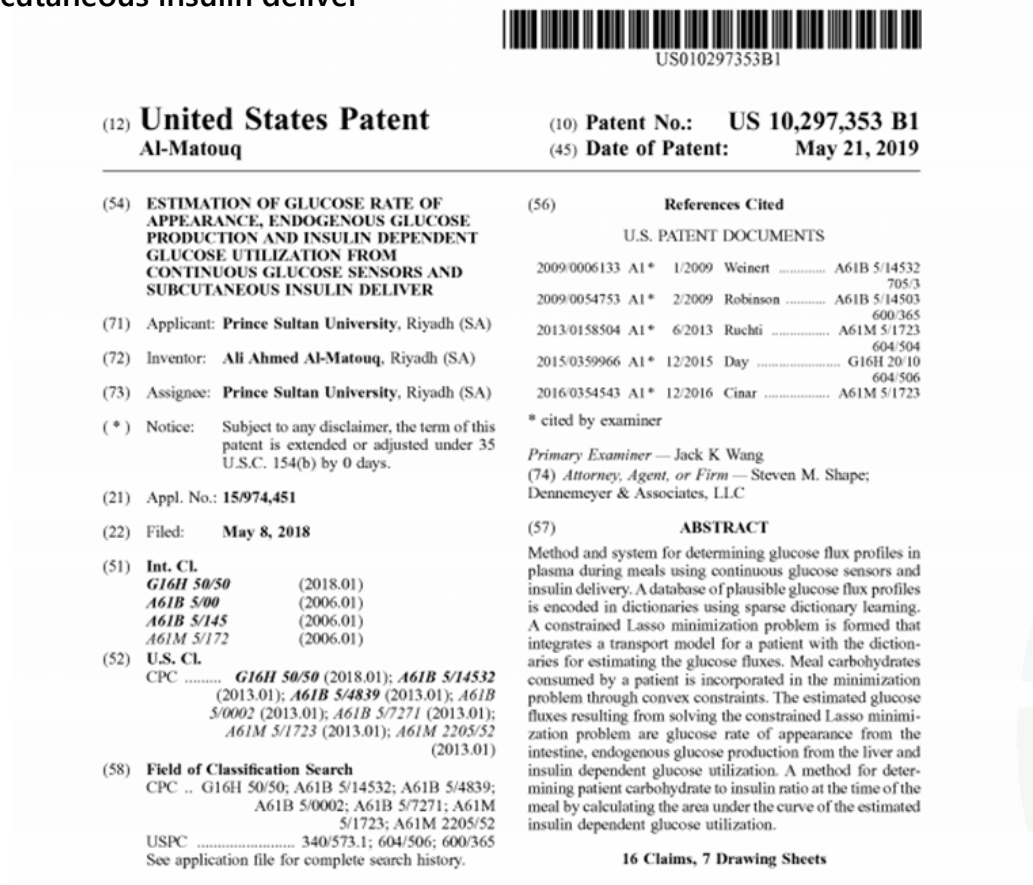
A method for controlling a plurality of vehicles to operate the plurality of vehicles in a platoon includes, within a leader vehicle selected from the plurality of vehicles: monitoring through a vehicle-to-vehicle communication a respective actual position of each of the plurality of vehicles that is not the leader vehicle based upon data from a respective global positioning device within each of the plurality of vehicles that is not the leader vehicle, determining distances to operate the plurality of vehicles in the platoon based upon the respective actual positions of each of the plurality of vehicles, and selecting a respective commanded vehicle position including a respective global positioning coordinate for each of the plurality of vehicles based upon the determined distances. Each respective commanded vehicle position is transmitted to the respective one of the plurality vehicles that is not the leader vehicle, and each respective one of the plurality of vehicles that is not the leader vehicle is operated based upon the respective commanded vehicle position.

Z Li, O Karoui, AKoubaa, M Khalgui, E Guerfala, E Tovar, N Wu

US20100256852A1 - US Patent: 9,927,816

A method for controlling plurality of vehicles to operate the plurality of vehicles in a platoon includes, within a leader vehicle selected from the plurality of vehicles.

Estimation of glucose rate of appearance, endogenous glucose production and insulin dependent glucose utilization from continuous glucose sensors and subcutaneous insulin deliver



US010297353B1

(12) **United States Patent**
Al-Matouq

(10) **Patent No.: US 10,297,353 B1**
(45) **Date of Patent: May 21, 2019**

(54) **ESTIMATION OF GLUCOSE RATE OF APPEARANCE, ENDOGENOUS GLUCOSE PRODUCTION AND INSULIN DEPENDENT GLUCOSE UTILIZATION FROM CONTINUOUS GLUCOSE SENSORS AND SUBCUTANEOUS INSULIN DELIVER**

(71) Applicant: **Prince Sultan University**, Riyadh (SA)

(72) Inventor: **Ali Ahmed Al-Matouq**, Riyadh (SA)

(73) Assignee: **Prince Sultan University**, Riyadh (SA)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **15/974,451**

(22) Filed: **May 8, 2018**

(51) **Int. Cl.**
G16H 50/50 (2018.01)
A61B 5/00 (2006.01)
A61B 5/145 (2006.01)
A61M 5/172 (2006.01)

(52) **U.S. Cl.**
CPC ***G16H 50/50*** (2018.01); ***A61B 5/14532*** (2013.01); ***A61B 5/4839*** (2013.01); *A61B 5/0002* (2013.01); *A61B 5/7271* (2013.01); *A61M 5/1723* (2013.01); *A61M 2205/52* (2013.01)

(58) **Field of Classification Search**
CPC .. G16H 50/50; A61B 5/14532; A61B 5/4839; A61B 5/0002; A61B 5/7271; A61M 5/1723; A61M 2205/52
USPC 340/573.1; 604/506; 600/365
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2009/0006133	A1*	1/2009	Weinert	A61B 5/14532 705/3
2009/0054753	A1*	2/2009	Robinson	A61B 5/14503 600/365
2013/0158504	A1*	6/2013	Ruchti	A61M 5/1723 604/504
2015/0359966	A1*	12/2015	Day	G16H 20/10 604/506
2016/0354543	A1*	12/2016	Cinar	A61M 5/1723

* cited by examiner

Primary Examiner — Jack K Wang
(74) *Attorney, Agent, or Firm* — Steven M. Shape; Dennemeyer & Associates, LLC

(57) **ABSTRACT**

Method and system for determining glucose flux profiles in plasma during meals using continuous glucose sensors and insulin delivery. A database of plausible glucose flux profiles is encoded in dictionaries using sparse dictionary learning. A constrained Lasso minimization problem is formed that integrates a transport model for a patient with the dictionaries for estimating the glucose fluxes. Meal carbohydrates consumed by a patient is incorporated in the minimization problem through convex constraints. The estimated glucose fluxes resulting from solving the constrained Lasso minimization problem are glucose rate of appearance from the intestine, endogenous glucose production from the liver and insulin dependent glucose utilization. A method for determining patient carbohydrate to insulin ratio at the time of the meal by calculating the area under the curve of the estimated insulin dependent glucose utilization.

16 Claims, 7 Drawing Sheets

US20100256852A1 - US Patent 10,297,353

AA Al-Matouq

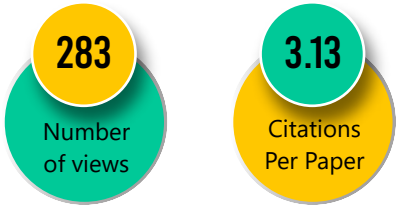
Method and system for determining glucose flux profiles in plasma during meals using continuous glucose sensors and insulin delivery.

Six more patents were submitted to US patent office which are under evaluation.

Metrics

Research on Industry, Innovation and Infrastructure

PSU's scholarly publications on Industry, Innovation and Infrastructure so far has 283 views and 3.13 citations per paper.



PSU's commitment to SDG 2030

PSU is committed to United Nations' Sustainable Development Goals (SDGs) through effective institutional resource management, innovative teaching and learning, research, national and international partnerships, continuous studies, and outreach. PSU shall undertake the following activities: form higher and steering committees, evaluate each SDG, formulate and develop related SDG policies, conduct awareness campaigns to the PSU community, establish a sustainability office, identify the SDGs related to each college, program, and course, and lab centers at PSU, and implement sustainability-related initiatives.

Vision

Prince Sultan University strives to support Saudi Arabia's Vision 2030 and the United Nations' Sustainable Development Goals (SDGs) by paving the way for higher education in KSA and Middle East.

Mission

Supporting the Saudi Arabia's Vision 2030 and the PSU's strategic directions, PSU aligns its mission with SDGs by providing quality education, sustainability initiatives, lifelong learning, scientific research, and community service.

جامعة الأمير سلطان
PRINCE SULTAN
UNIVERSITY

P.O. Box No. 66833, Rafha Street, Riyadh 11586,
Saudi Arabia.

©2020 All copyrights reserved