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Using Math-Physics medicine to predict PPG for T2D

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The author developed two prediction tools and was able to reduce his PPG from 380 mg/dL to 116 mg/dL, daily glucose from 279 mg/dL to 117 mg/dL, and A1C from 10% to 6.1%. The author examined correlations between PPG and three known major factors, medication, carbs and sugar intake, exercise and other secondary factors, including stress/tension, measurement time delay, traveling, illness, sleep disturbance, seasonal weather, etc. In summary, more than 20 elements were considered and over 1 million data collected. During 934 days (from 6/1/2015 to 12/21/2017), he had 2,802 meals and collected about 60,000 PPG-related data. The conclusions were: +60% correlation between PPG and carbs and sugar intake (average 14.7 gram and 38% contribution rate); 64% correlation between PPG and post-meal walking (average 4,300 steps and 43% contribution rate). Collectively, these secondary factors account for approximately 19% (weather has contributed 10%) of the predicted PPG values. Those collected 2,800 meal photos were analyzed against 6 million food data collected and re-processed from US government and stored in cloud server. All food data were sorted according to country, franchise restaurants, individual cafes, home-cooked meals, airline food, etc. Here are some examples: Airline food - 136 mg/dL; Restaurant food - 127 mg/dL; Home Cooking - 111 mg/dL. The predicted PPG (115.5 mg/dL) vs. measured PPG (120.5 mg/dL) has a linear accuracy rate of 96% and 87% correlation.

Biography

Gerald C Hsu has received his PhD in Mathematics and majored in Engineering at MIT. He has attended different universities over 17 years and studied seven academic disciplines. He has spent a huge time research in T2D research. His approach is "Math-Physics and Quantitative Medicine" based on mathematics, physics, engineering modeling, signal processing, computer science, big data analytics, statistics, machine learning and AI. His research focus is on preventive medicine using prediction tools.

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