Problem:
• 1 in 3 people in the US have prediabetes and 90% don’t know.
• In 2012, the cost of treating diabetes in the US was $243 billion.
• Average cost of Insulin $700/year
• Cost of Insulin has tripled from 2003 to 2013
• Regulated diet and exercise is difficult without the proper support and motivation.
• Other nutrition monitoring apps have low adherence (mostly due to text-driven interface)

Goal:
• Provide the first ever speech-to-text app for counting calories.
• App design tailored to be coupled with a lifestyle change program monitored by a trained nutritionist.
• 58% of prediabetics can prevent the development of diabetes by undergoing a structured lifestyle change program
• Preventative health care measures can help bring US’s rising medical costs down

Specifications
Mobile App:
• Convert speech to calories
• Automated prompting for insufficient input
• Display user input
• Show additional nutrient information

Web Portal:
• Clinicians can monitor their patients’ activity
• Clinicians can provide immediate feedback
• Patients can view their progress over time
• Progress is displayed as either a table or graph

Additional Requirements:
• Integrate NLP, and USDA database

Framework
Diagram of our project’s structure and key elements. The dotted lines represent our Linux server which encapsulates the API, NLP Script, and Database.

Data Flow
Diagram to represent the flow of data when the user inputs a food entry on the app

App User Interface

Natural Language Processor (NLP)
• A pre-defined set of patterns is used to locate food names in a given sentence by mapping words to patterns i.e. (orange juice) noun + noun, (mac and cheese) noun + conjunction + noun
• Works by tokenizing sentences and tagging each word with its part-of-speech

Additional Features
• Two way chat interface
• Integration of API.AI machine learning unit
• Visual display of calorie intake on the app

Future Work
• Barcode and photo-analysis features
• Incorporation of additional nutrients (fats, carbs, etc)
• Personalized database entries
• Extend usability to record physical activity
• Automated feedback based on User’s daily performance
• Daily health tips
• Extended User Acceptance Testing

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Team Speech2Health