Honors 177

MIDTERM

Before and Avatar:
A virtual guide to fitness, health, and your future

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ABSTRACT

In this project, participants will be able to create a life-like avatar based on their genetic makeup. The participant will input their personal diet and exercise habits for the avatar, which will then use all the information (I.e. genetic, environmental factors) to visually represent the participant's future health and risk of illness. Hopefully, this digital art can visually convey the dangers of an unsustainable lifestyle and provide a motivation for adopting healthier habits.

CONCEPT / TOPIC

The goal of the project is to call attention to the risk of obesity and heart disease caused by an unhealthy lifestyle. As of last year, one in four people were obese in 30 states[1], and it is estimated that by 2015 20 million people will die from cardiovascular disease[2]. Furthermore, the World Health Organization states that the leading causes of cardiovascular disease are an unhealthy diet (high in cholesterol and fat) and lack of exercise[3].

What is alarming is that in spite of medical advances that prove that habits developed early in life can have long-term effects[4], the urgency of today may not be clear just by statistics.

CONTEXT & PRECEDENTS

Political officials around the country have offered legislation to address this problem. One L.A councilwoman proposed banning fast-food restaurants around public schools[5]. The governor of New York proposed taxing non-diet drinks[6]. Governor Schwarzenegger has moved to introduce more fruits and vegetables into menus at public schools and to reduce the amount of junk food[7]. Still, while these bills may change external conditions, they do not change internal attitudes and do not give a sense of the personal cost to individuals. Technology might be able to give a sense of the personal cost in the future.
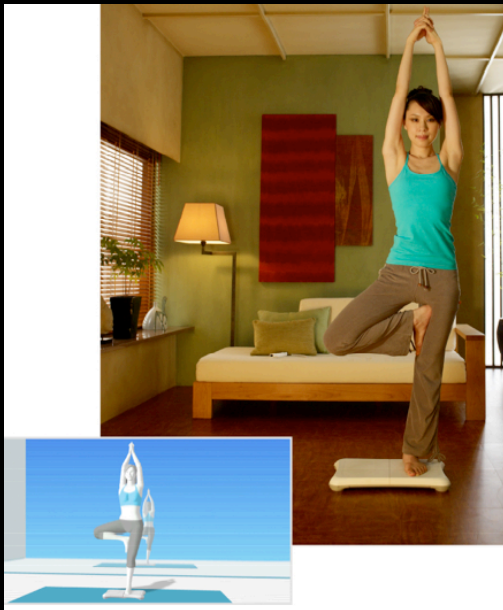
Second life, the Sims, and Wii Fit all make use of avatars, and Wii Fit allows us to monitor our health, but none of these avatars are modeled exactly in our own likeness and none of them project into the future what we would look and feel like if we adopted certain lifestyle habits. This one-of-a-kind project would give individuals a realistic sense of life in the future.

PROJECT PROPOSAL

Input Diet plan:

Week 1
Monday
      Breakfast: Honey Bunches of Oats, Milk
      Lunch: (Trader Joes) Peanut butter and Jelly on Whole grain Bread with Lentil Soup, Water.
      Dinner: Salmon (from Ralphs) and Steamed Veggies (Broccoli, Green Beans), Water.
      Snacks: Sun Chips, Bag of Almonds, Sprite.
Tuesday
Wednesday
Thursday
Friday

Input Physical Activity:
Week 1
Monday: **Swimming (10 laps; 100 m each lap), 100 Sit-ups, 100 push-ups**
Tuesday:
Wednesday:
Thursday:
Friday:

[Note: Monday inputted as an example]

Participants will be allowed to provide a cheek swab or a blood sample for DNA information as well as basic height/weight/appearance data that will be scanned into a computer that will create a realistic and life-like avatar of the participant. The program will have options for the participant to input approximate dieting habits and workout schedule for the avatar for a period of time (options will vary: I.e. four weeks, 20 years, 40 years). The program will determine caloric intake from a caloric database based on what is inputted, calculate likelihood of illness from DNA and family history and weight loss/gain based on the participant's genetic predisposition and exercise habits. The program will also be able to provide information on effects of genetically modified foods.

Project Proposal (cont.)
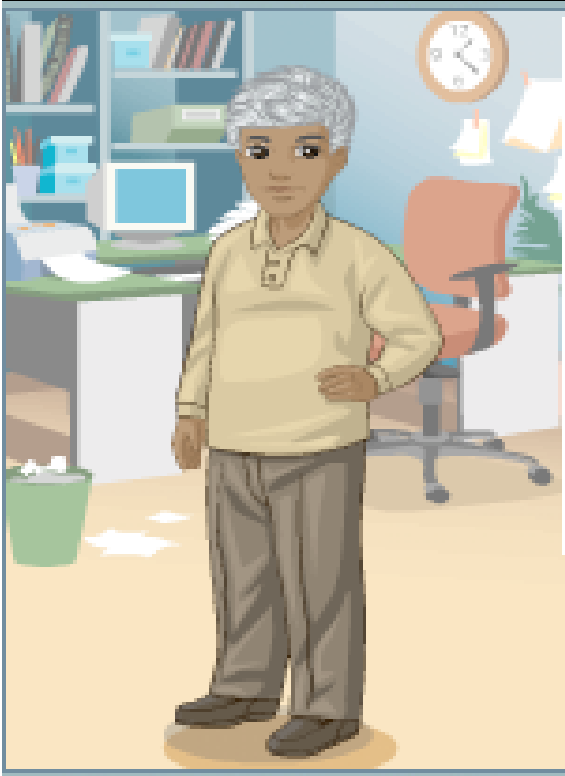
Suggestion/Recommendation:

Regarding your Future Back:

Try to cut down on heavy lifting or at least take precautions to avoid back injury. This seems to have taken a toll on you.

Regarding Fatigue:

Try to incorporate more walking into your daily routine. 10-15 minutes should help a lot, but consult your doctor for more specific tips

The program will then predict appearance and health into old age. Here is a picture of the avatar at an older age had the avatar put on some weight and exercised only marginally. The avatar would not just be a picture but would be animated and would model the participant's movements at that age as well. For example, here the avatar is holding his side since he has back problems from not working out his back properly. The avatar is wheezing,coughing, and complaining about frequent fatigue. If there is a family history of heart disease, the effects on the avatar may be even more drastic.

Project Proposal (cont.)

Besides exercise and eating habits, there will be the option for participants to assess their risk of cancer based partly on their racial or ethnic background and partly on the environmental conditions in the area in which they live. For example, depending on a participant's exposure to sunlight, the pollution in the region, and their race, the program can estimate likelihood of skin cancer. While the goal is not to scare participants, a recommendation can be provided on ways to reduce risks they can control. For example, the program can suggest the participant wear stronger sunscreen when swimming.
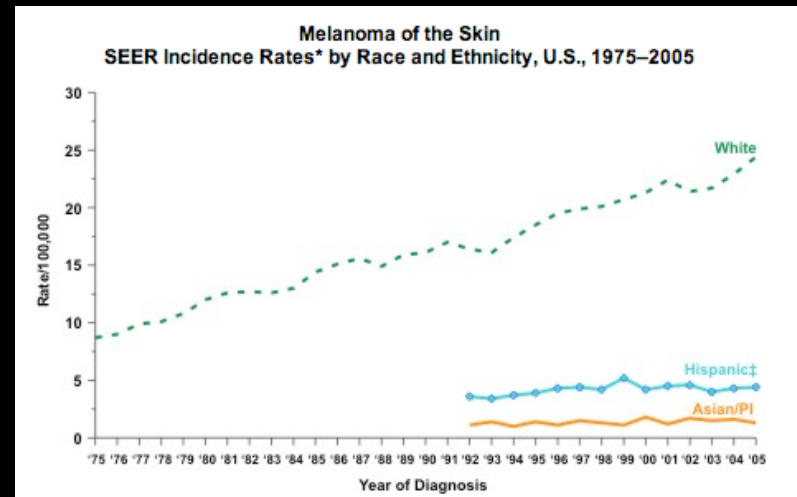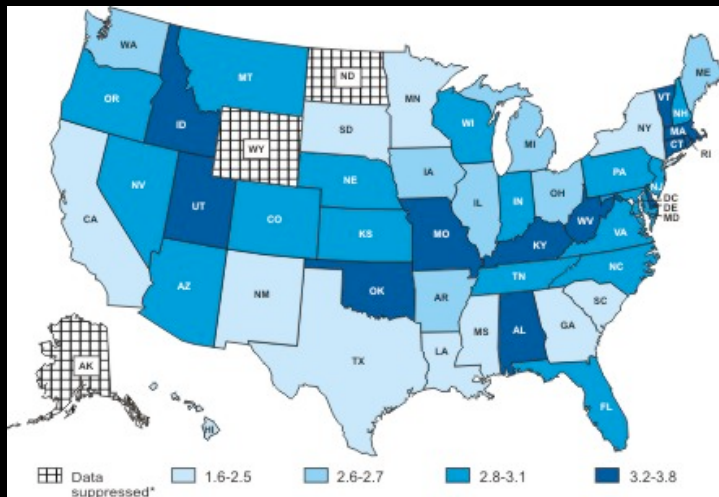
Data from the Center for Disease Control and Prevention show that race and region do matter

Conclusion

An offshoot of this project could be an interactive installation where a participant simulates the experience of their avatar in the future and what they are going through. A weighted wet suit could be put on to simulate weight gain, blurry vision could ensue if there is a Vitamin B deficiency, and the participant could have trouble bending over if they do not take care of their back. Of course, both the virtual avatar and this interactive installation would just be approximations, but would serve a vital artistic function in using science and technology to bring exposure to an important cause.

References

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<http://www.cdc.gov/nccdphp/dnpa/obesity/trend/maps>.

2 "Cardiovascular Diseases". World Health Organization. April 24, 2009
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3 Ibid.

4 "Foundation for poor heart health laid early in life". Medical Research News. April 24, 2009
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5 "L.A official proposes fast-food ban for city." Associated Press. *MSNBC* 11 Sep 2007
http://www.msnbc.msn.com/id/20726137/.

6 Blain, Glenn, and Kenneth Lovett. "Governor Paterson proposes 'Obesity Tax,' a tax on non-diet sodas." New York Daily News 2008. 24 Apr. 2009 <http://www.nydailynews.com/ny_local/2008/12/14/2008-12-14_governor_paterson_proposes_obesity_tax_a-1.html>.

7 United States. Government of California. "Governor Schwarzenegger Signs Landmark Legislation to Combat Childhood Obesity." Press Release. 15 Sep. 2005. http://gov.ca.gov/index.php?/press-release/1424/.

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