

# A Dynamic Model of Human Populations

By Joshua Choi

TJHSST Computer Systems Lab 2007-2008

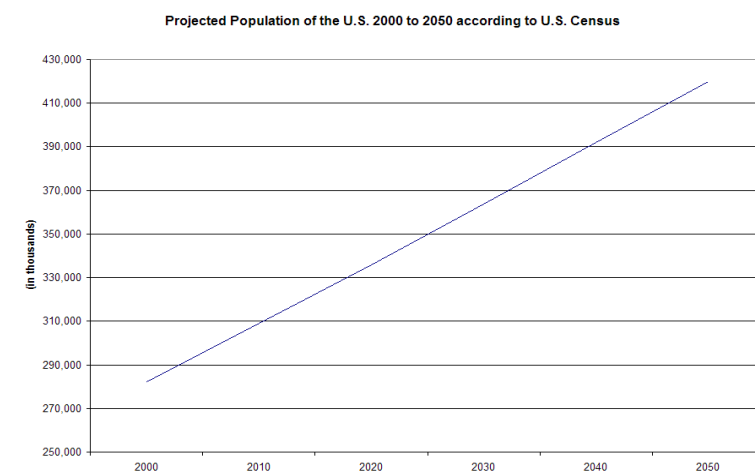
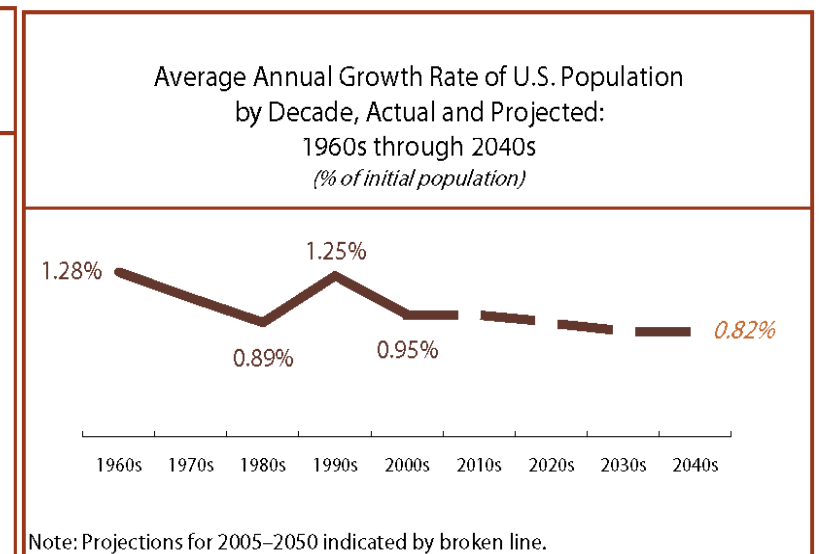
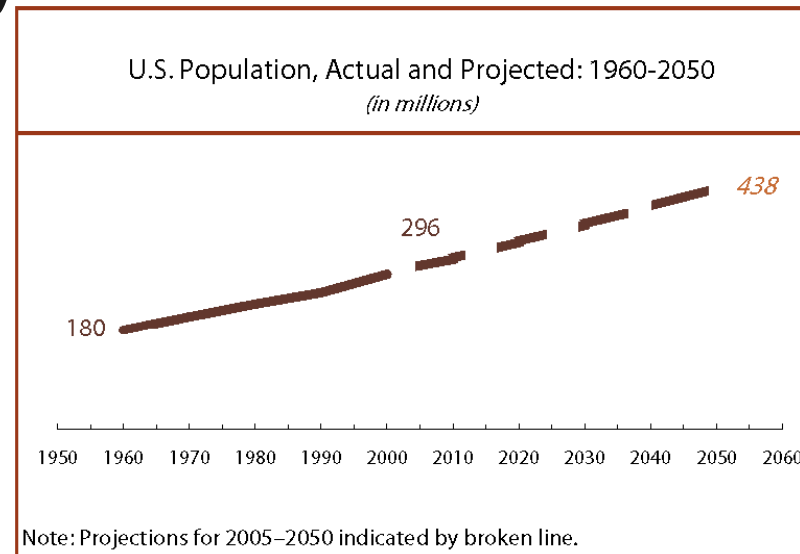
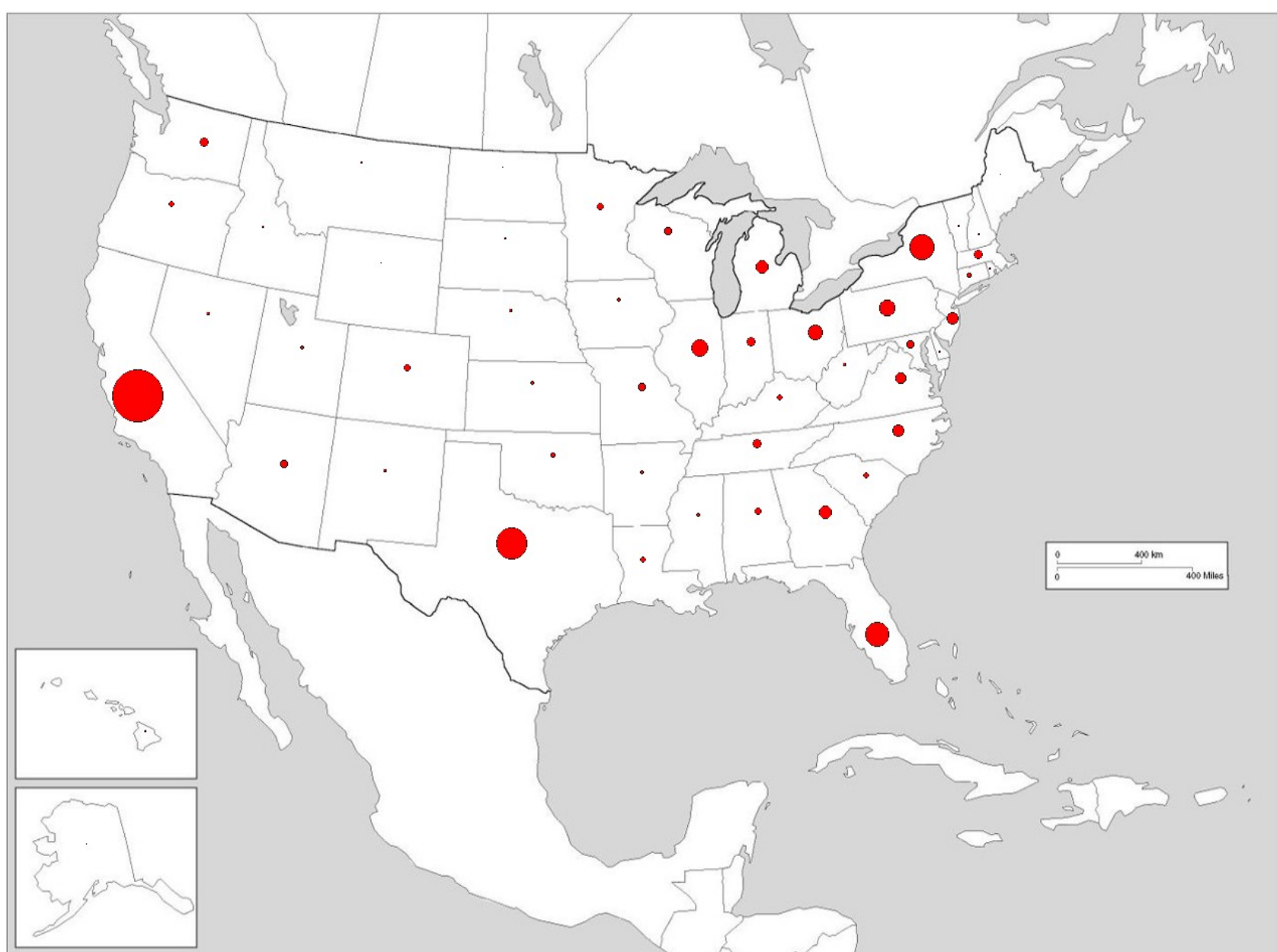
## Abstract

The world is becoming better interconnected. As more and more people in developing countries seek to live in economically secure ones, less and less people stay in their own. This constantly changing flux of movement highlights just how important understanding the dynamics of human population is. This project attempts to analyze and understand the growths of a population and the migrations of people across the world. Through understanding how human populations develop, we can predict changes in the future.

## Introduction

The human population of the world is now at 6 billion and counting. It is constantly growing, constantly moving. To even try to use human power to analyze all of this data would require thousands of people and thousands of hours of man power to complete. By using computers, we can drastically cut down on the man power needed.

This project can be useful for a great variety of problems. Most prominently, the US takes a census report every ten years. But every decade in between, the census department uses the data gathered to estimate population values. A dynamic model such as the one this project would achieve would be invaluable in assisting their efforts.



## Background

Because population is such an important topic, there is a huge amount of research done on the topic, be it similar population predictions, analysis of human carrying capacities, or other factors involved such as urbanization and globalization.

## Procedure

This project works by calculating a population growth rate value using population data for a certain group. First, it starts from the states level. Then, it moves on to the entire US, in which it obtains the growth rate for each and every state. It takes those rates, displays a graphical representation of the growing population with it, and calculates the growth rate of population for the entire country. A migration factor has also been factored into the project.

## Testing and Analysis

With an error margin of about 4.62 percent for projected population, and error margin increase over time of about 41.85 percent for projected growth rates, this project was only mildly successful. The huge increase in error margins for the second factor could probably be attributed to the many factors this project does not consider but the U.S. Census Bureau does consider, such as age, sex, and race.