MODEL OF UNCOUNTABLY INFINITE HUMAN BEINGS

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1. Motivation

We would like Social Science to be based on some smooth densities on $\mathbf{R}$. Now the actual human race is a finite set and we show below we cannot produce smooth densities. We want to consider embedding of human race H_0 into a larger smooth manifold. We are not interested in doing this frivolously but for scientific models of the Human Race.

This is not so strange. We could consider for example $H_0 \to H \to \mathbf{R}$ where $i : H_0 \to H$ is an inclusion or embedding and the smooth density is from distribution of $v : H \to \mathbf{R}$ so that law of v has a smooth density.

2. Embedding

There are 7.8 billion humans on Earth. Let H_0 be a finite set representing them with $|H_0| = 7.8 \times 10^9$. We are not satisfied with this in our view of the world. We will consider embedding H_0 in a Euclidean space $H_0 \subset H$. This extension is valuable for us. This is crucial for us.

We want to take continuous densities seriously on human race measurements. If we leave finite H_0 then if we consider the measurement $v : H_0 \to \mathbf{R}$ then we cannot have a smooth density for the distribution of v. This is easy to see because the $v(H_0)$ is finite, and therefore we can find an interval in the complement of $v(H_0)$ and the distribution of v cannot have positive mass on it.

We will extend human race to be represented by H which is a continuous parameter space, say $H \subset \mathbf{R}^G$. This will allow us to consider functions with distributions that have a smooth density on $\mathbf{R}$.

3. Steps Toward a Scientific Framework

We believe Social Science will great progress with an embedding of $H_0 \to H$ and doing analysis for H and restricting to H_0.

4. Example

Personality models would embed $H_0 \to \mathbf{R}^5$

5. Embedding By Infinite features

One sort of idea is to embed H_0 in an infinite dimensional Hilbert space H as follows. We suppose that all measurable features of a human being is a countable sequence φ_j and $1 \leq j < \infty$. Then we take some standard complete Hilbert space and choose an orthonormal basis e_j. Then map $h \in H_0$ to $(e_j \varphi_j(h))$. Then we

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want to put a special probability measure P_H on H such that for any measurement v of H, we have $v_*(P_H) \in GHD(\lambda, \mu, \sigma, \gamma, \bar{\alpha})$ for some parameters.

In other words, every measurement pushes pushes P_H to a generalised hyperbolic distribution.

Let us pretend this setup is possible and self-consistent. Considering the measurements ϕ_j themselves we are seeking a GHD on infinite dimensions.

6. Some Conditions

We put the conditions that given any two humans $h_1, h_2 \in H_0$ who are distinct, there exist ϕ_a such that $\phi_a(h_1) \neq \phi_a(h_2)$. In other words, these ϕ_j separate all pairs of humans.

Second we ask that

$$|\phi_k(h)| \leq Ck^{-2}$$

These conditions ensure that

$$\|\phi(h)\|_2 < \infty$$

where

$$\phi(h) = \sum_j \phi_j(h) e_j$$

So we have *separability of humans* by our series of metrics and we have square-integrability so that H is isomorphic to an ℓ^2.

Then we want to put a Generalised Hyperbolic Distribution on H with various projection properties.

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