

An Essay on Hindu Philosophy from a Mathematician's Perspective

Introduction

It is a spectacular thing to observe that only a few of the Great Religions of the World have a philosophical basis that is grounded in raw logical thinking. Hinduism in its most Ancient theological form belongs to this special class, where all ponderings on the human condition are akin to a mathematician musing on the properties of numbers or a physicist churning meaning out of symbols and equations.

This essay attempts to demonstrate how, much of what is considered the profoundest of Ancient Hindu doctrines can be tamed to fit into a systematic axiomatic framework, by means of which higher truths can be arrived at. Beginning with an elucidation of basic doctrines and statements of symbolic axioms, theorems are then formulated.

Definitions

Definition 1: Doctrine of Karma

The sum total of an individual's actions during his/her life-time.

Definition 2: Doctrine of Dharma

A right action may be called dharma. A right action is one that leads to the improvement of:-

- (i) one's own state of affairs;
- (ii) one's neighbor's state of affairs;
- (iii) both (i) and (ii) in conjunction;

Example 2a: Sacrifice

The highest form of dharma may be called sacrifice, where one's actions are directed towards the improvement of (ii), at the cost of the detriment of (i).

Example 2b: Benevolence or Charity

The form of dharma just one step lower than Sacrifice may be called Benevolence or Charity, where one's actions are directed towards the improvement of (ii) for no identifiable reason, without however causing any detriment to (i).

Definition 3: Doctrine of Adharma

A wrong action may be called adharma. A wrong action is one that leads to the detriment of:-

- (i) one's own state of affairs;
- (ii) one's neighbor's state of affairs;
- (iii) both (i) and (ii) in conjunction;

Example 3a: Raw Malice

The lowest form of adharma may be called Raw Malice, where one's actions are directed towards the detriment of (ii), for no identifiable reason. Other less severe variants of Raw Malice include Malice motivated by Envy and Malice motivated by Prejudice.

Example 3b: Greed

The form of adharma just one step higher than Malice may be called Greed, where one's actions are directed towards the detriment of (ii) for the sake of the improvement of (i).

Definition 4: Doctrine of The Immortality of the Soul or Atman: The soul is neither created at birth nor destroyed at death but only passed on from one body at the end of one life to another body at the beginning of the next life.

Definition 5: Doctrine of The Transmigration of the Soul: The soul at the time of death passes on from one body to the next depending on the state of one's Karma. Good Karma leads to promotion in the next life. Bad Karma leads to demotion in the next life.



Axioms

Axiom 1: Symbolic Representation of Dharma

Dharma is represented by the letter ' d ' and has unit positive magnitude, i.e. $d = 1$.

Axiom 2: Symbolic Representation of Adharma

Adharma is represented by the letter ' a ' and also has unit positive magnitude, i.e. $a = 1$.

Axiom 3: Quantitative Relationship between Dharma & Adharma

Both dharma and adharma are associated with weights. While dharma is associated with a *positive numerical weight* denoted by ' w_d ', adharma is associated with a *negative numerical weight* denoted by ' w_a '. Their magnitudes depend on the Gradient of Action or Action Spectrum for the particular Ethical System adopted.

Axiom 4: Symbolic Representation of Karma

Karma is represented by the letter ' K '.

Axiom 5: The Hierarchy of Life: The state of an embodied soul for a given life belongs to a specific tier category. The different tier categories are arranged in an orderly fashion i.e. in a graded manner. The highest or best or most desirable kind of life is denoted by ' G_0 ' and the lowest or most pitiable kind is denoted by ' G_p '. Thus, the hierarchical sequence can be written in a descending order from the highest to the lowest levels as follows: $G_0, G_1, G_2, \dots, G_p$.

Axiom 6: Gradient of Action or Action Spectrum: Every human action can be assumed to lie somewhere between opposite ends of a vertical spectrum. Malice lies at the lower extreme, being the most deplorable of all possible human actions. And Sacrifice lies at the upper extreme, being the most worthy of praise.

Theorems

Discrete Karma Theorem: It follows from the Doctrinal Definitions 1, 2 & 3 and the Symbolic Axioms 1, 2, 3 & 4 that Karma can be quantitatively expressed as follows for a total of 'm' dharmas and 'n' adharms performed during an entire lifetime:

$$K = w_{d1}d_1 + w_{d2}d_2 + w_{d3}d_3 + \dots + w_{dm}d_m + w_{a1}a_1 + w_{a2}a_2 + w_{a3}a_3 + \dots + w_{an}a_n$$

$$K = \sum_{i=1}^{i=m} w_{di}d_i + \sum_{j=1}^{j=n} w_{aj}a_j$$

Corollary: Supposing that the weights for dharma and adharmas were of equal magnitude, say unit, but of opposite sign, i.e. $w_{di} = 1$ for all i and $w_{aj} = -1$ for all j . Then the above theorem would collapse to take the following condensed form:

$$K = \sum_{i=1}^{i=m} d_i - \sum_{j=1}^{j=n} a_j$$

Since by axioms 1&2, each dharma and adharmas carries a unit magnitude i.e. $d_i = 1$ and $a_j = 1$ for all i and j respectively the above equation becomes:

$$K = m - n$$

Lemma: The fate of a Soul depends on the state of one's Karma at the end of life. The new birth may either occur at a higher level in the Hierarchy of Life, if the Karma is positive or at a lower level, if the Karma is negative. The Karma Theorem takes the following two inequality forms:

$$K = m - n > 0 \Rightarrow \text{Ascent along the Hierarchy of Life } (G_p \rightarrow G_0 \text{ direction})$$

$$K = m - n < 0 \Rightarrow \text{Descent along the Hierarchy of Life } (G_0 \rightarrow G_p \text{ direction})$$

Aliter: The above Karma Theorem can be re-stated in terms of Frequency of Actions $f(t)$, which is defined as the average Number of Actions Δn , (sum of the dharma and adharmas) performed in a certain interval of time Δt . An individual's lifespan from birth to death, can then be divided into i number of such equal

time intervals Δt_i , each of which have an Action Frequency $f_i(t)$ associated with them. Summing the Number of Actions Δn_i over a total of n such intervals yields the Karma:

$$K = \sum_{i=1}^{i=n} \Delta n_i = \sum_{i=1}^{i=n} f_i(t) \cdot \Delta t_i$$

Continuous Karma Theorem: In the previous section, Karma was treated as a discrete quantity. However, if it is assumed that at every instant of time during life, spanning from birth to death, it was possible to perform an action, then Karma can be regarded as a continuous quantity. Say that the frequency of actions over a finite period of time Δt is $f(t)$. Then the Karma Theorem can be re-written as an integral, as follows:

$$K = \int_{\text{Birth}}^{\text{Death}} dn = \int_{\text{Birth}}^{\text{Death}} f(t) \cdot dt$$

Condition to be fulfilled: In order that the transition from a discrete analysis to a continuous analysis be made, it is necessary to assume that the Action Frequency defined as an average quantity over an interval of time can be expressed as an instantaneous quantity defined at every instant of time.

$$f(t)_{av} = \frac{\Delta n}{\Delta t} \xrightarrow{\text{yields}} f(t)_{inst} = \lim_{\Delta t \rightarrow 0} \left(\frac{\Delta n}{\Delta t} \right) = \frac{dn}{dt}$$

The justification for the above shift can be made by exploiting the poor graphical resolution that results between data points when choosing to represent relatively long units of time by relatively short units of distance on paper. To illustrate this point, let the lifespan L (in years) of an individual be represented by a straight line of length l (in centimeters) on paper. Then, the line l can then be sub-divided into n equal time-intervals spanning τ units each. The gross disparity between the chosen units of time and length help ensure that each interval is associated with a finite Action Frequency, no matter how small that interval may be reasonably made. Thus, the following relations should hold true:

$$L \text{ (in years)} \leftrightarrow l \text{ (in centimeters)}$$

$$\tau \text{ (in years)} \leftrightarrow \left(\frac{l}{L} \right) \tau \text{ (in centimeters)}$$

$$n = \frac{L}{\tau}$$

From the above relations, it is clear that as $\tau \rightarrow 0 \Rightarrow n \rightarrow \infty$ which means that a discrete formulation of Karma (based on the concept of discrete action frequency - $f_i(t)$) can be transformed into a continuous formulation of Karma (based on the concept of continuous action frequency - $f(t)$). That is,

$$\sum_{i=1}^{i=n} f_i(t) \cdot \Delta t_i \xrightarrow{\text{yields}} \int_0^L f(t) \cdot dt$$

The Karma Neural Network

The nodes of this network receive dharma and adharma as inputs. Following multiplication by suitable weights for each action, and then performing a summation of the products, the final Karma of the soul can be computed. This is then squashed using a squashing function, which tames the magnitude of K to within fixed upper and lower bounds.

It is interesting to ask “does God make use of a similar abstract computing machine to decide the Fate of a Soul at the time of death?”

