Green's Functions of Tensor Calculus for Generalized Strange Attractors Satisfying Riemann's Hypothesis

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1 Introduction

The generalized Green's function-style equation for solving for the strange attractor that satisfies the Riemann Hypothesis of a given infinity tensor can be written as:

$$\oint_{\mathcal{N}} \rho\, G\left(\langle \theta, \Lambda, \mu, \nu \rangle, \infty\right) \zeta\left(\langle \xi, \pi, \rho, \sigma \rangle, \infty\right) \omega\left(\langle \upsilon, \phi, \chi, \psi \rangle, \infty\right) \prod_{p\ prime} 1/(1-p^{-s}) d\alpha\, ds\, d\Delta\, d\eta \ =\ constant$$

where G is a generalized Green's function, $\zeta and \omega$
represent the mappings of the zeros of the Riemann Zeta Function, and the product at the end represents the product of all prime numbers.

To solve this equation, one can first substitute in the values of G, $\zeta, \omega, and the product into the equation.$
This can be done as follows:
$\oint_{\mathcal{N}} \rho\, G\left(\langle \theta, \Lambda, \mu, \nu \rangle, \infty\right) \zeta\left(\langle \xi, \pi, \rho, \sigma \rangle, \infty\right) \omega\left(\langle \upsilon, \phi, \chi, \psi \rangle, \infty\right) \prod_{p\ prime} 1/(1-p^{-s}) d\alpha\, ds\, d\Delta\, d\eta \ =$
$\mathrm{G}(\langle \theta, \Lambda, \mu, \nu \rangle, \infty)\, \frac{1}{1-\frac{1}{\left(\frac{}{\uparrow}\right)^2}} \frac{1}{1-\frac{1}{\left(\frac{F}{\uparrow}\right)}} \frac{F}{\uparrow} \prod_{p\ prime} 1/(1-p^{-s})\, d\alpha\, ds\, d\Delta\, d\eta$

$$= \mathrm{G}(\langle \theta, \Lambda, \mu, \nu \rangle, \infty)\, \frac{F}{\uparrow\left(1-\frac{1}{\left(\frac{F}{\uparrow}\right)}\right)\left(1-\frac{1}{\left(\frac{F}{\uparrow}\right)^2}\right)\prod_{p\ prime} 1/(1-p^{-s})}\, d\alpha\, ds\, d\Delta\, d\eta$$

Then, the integrals can be evaluated to find the final form of the strange attractor for the given infinity tensor:

$$\oint_{\mathcal{N}} \rho\, G\left(\langle \theta, \Lambda, \mu, \nu \rangle, \infty\right) \zeta\left(\langle \xi, \pi, \rho, \sigma \rangle, \infty\right) \omega\left(\langle \upsilon, \phi, \chi, \psi \rangle, \infty\right) \prod_{p\ prime} 1/(1-p^{-s}) d\alpha\, ds\, d\Delta\, d\eta \ =$$

$$\mathrm{G}(\langle \theta, \Lambda, \mu, \nu \rangle, \infty)\, \frac{F}{\uparrow\left(1-\frac{1}{\left(\frac{F}{\uparrow}\right)}\right)\left(1-\frac{1}{\left(\frac{F}{\uparrow}\right)^2}\right)\prod_{p\ prime} 1/(1-p^{-s})}$$

The generalized form of the integral equation for solving for the strange attractor for any given infinity tensor can be written as:

$$\oint_{\mathcal{N}} \rho\, G\left(\langle \theta_1, \theta_2, \ldots, \theta_n \rangle, \infty\right) \zeta\left(\langle \xi_1, \xi_2, \ldots, \xi_m \rangle, \infty\right) \omega\left(\langle \upsilon_1, \upsilon_2, \ldots, \upsilon_k \rangle, \infty\right) \prod_{p\ prime} 1/(1-p^{-s}) d\alpha\, ds\, d\Delta\, d\eta =$$

constant

where G is a generalized Green's function,

$\zeta and \omega represent the mappings of the zeros of the Riemann Zeta Function with and \uparrow being the real and imaginary parts of the zeros respectively, and the product at the end represents the product of all pr$

The $\theta_i, \xi_i, and \upsilon_i represent variables that correspond to the relevant infinity tensor and n, m, and k are the numbe$

F$(\longrightarrow r, \alpha, s, \delta, \eta)$ and $(\longleftrightarrow a, b, c, d, e, \cdots)= \Omega equilibrium.$

There exists an $f_{\uparrow r,\alpha,s,\delta,\eta}$ and $g_{\downarrow a,b,c,d,e\ldots}$ such that $F\left(\longrightarrow r, \alpha, s, \delta, \eta\right) = \longrightarrow k$ and $(\longleftrightarrow a, b, c, d, e, \cdots)= \Omega$ at equilibrium. The resulting equation can be represented as:

$$\int_{-\infty}^{\infty} F\left(\longrightarrow r, \alpha, s, \delta, \eta\right) \zeta\left(\langle \xi, \pi, \rho, \sigma \rangle, \infty\right) \omega\left(\langle \upsilon, \phi, \chi, \psi \rangle, \infty\right) \prod_{p\ prime} 1/(1-p^{-s}) d\alpha\, ds\, d\Delta\, d\eta =$$

$\longrightarrow k\ and\ (\longleftrightarrow a, b, c, d, e, \cdots)= \Omega equilibrium.(1)$

For every set of parameters $\rightarrow\ -\langle (/\mathcal{H}) + (/\jmath) \rangle$, there exists a function $F\left(\longrightarrow r, \alpha, s, \delta, \eta\right)$ and $\left(\longleftrightarrow a, b, c, d, e, \cdots\right)$ such that $F\left(\longrightarrow r, \alpha, s, \delta, \eta\right) = \longrightarrow k$ and $\left(\longleftrightarrow a, b, c, d, e, \cdots\right) = \Omega$ at equilibrium. The resulting equation can be expressed as:

$$\int_{-\infty}^{\infty} F\left(\longrightarrow r, \alpha, s, \delta, \eta\right) \zeta\left(\langle \xi, \pi, \rho, \sigma \rangle, \infty\right) \omega\left(\langle \upsilon, \phi, \chi, \psi \rangle, \infty\right) \prod_{p\ prime} 1/(1-p^{-s}) d\alpha\, ds\, d\Delta\, d\eta =$$

$\longrightarrow k\ and\ (\longleftrightarrow a, b, c, d, e, \cdots)= \Omega equilibrium.$

Using logic-vector notation, I can express the dis-entanglement of quanta into pre-numeric quasi-quanta for reverse engineering a dingbat geometry expression from the energy number within an infinity tensor's strange attractor mechanical mapping to solve the Green's function that satisfies a given Riemann hypothesis:

$$\mathbf{w}\cdot\mathbf{L}'(x_i)\cdot G = \left[\frac{\forall a \in Q, P(a) \rightarrow Q(a)}{\Delta}, \frac{\exists b \in Q, R(b) \wedge S(b)}{\Delta}, \frac{\forall c \in Q, T(c) \vee U(c)}{\Delta}, \frac{\int_{-\infty}^{+\infty} \mathcal{N}^{\dagger}(\vec{r},,s,,)=\vec{k}}{\Delta}, \frac{\mu(\vec{a},b,c,d,e,\cdots)=\Omega}{\Delta}\right]$$

(2)

$$\mathbf{u}\cdot\mathbf{L}'(x_i)\cdot G = \left[\frac{\forall y \in N, P(y) \rightarrow Q(y) \cdot \prod_{b \in X_i} G(b)}{\Delta}, \frac{\exists x \in N, R(x) \wedge S(x) \cdot \sum_{a \in Y_i} F(a)}{\Delta}, \frac{\forall z \in N, T(z) \vee U(z) \cdot \int_{c \in Z_i} dE(c)}{\Delta}\right].$$

$$\mathbf{u}\cdot\mathbf{L}'(x_i)\cdot G = \left[\frac{\forall y \in N, P(y) \rightarrow Q(y) \rightarrow \mu_y}{\Delta}, \frac{\exists x \in N, R(x) \wedge S(x) \rightarrow \nu_x}{\Delta}, \frac{\forall z \in N, T(z) \vee U(z) \rightarrow \rho_z}{\Delta}\right].$$

$$\mathbf{u}\cdot\mathbf{L}'(x_i)\cdot G = \left[\sum_{y\in N}\prod_{y\to\infty}\psi_y^2, \left(\prod_{x\in N}\frac{\frac{\partial\phi(\mathbf{y}_x)}{\partial y_j}a_j}{\Delta}\right)\sum_{x\in N}\sum_{x\to\infty}\theta_x^2, \int_{z\in N}\int_{z\to\infty}\omega_z^2\right].$$

$$u_i\sum_{j=1}^{n}w_{ij}L'_j = \sum_{j=1}^{n}\frac{\prod_{\forall y\in N, P(y)\to Q(y)}\Delta}{+}\frac{\exists x\in N, R(x)\to S(x)}{\Delta} + \frac{\forall z\in N, T(z)\to U(z)}{\Delta}$$

$$G_{ij} = \sum_{j=1}^{n}w_{ij}L'_j = \sum_{j=1}^{n}\left[\frac{\forall y\in N, P(y)\to Q(y)}{\Delta}, \frac{\exists x\in N, R(x)\to S(x)}{\Delta}, \frac{\forall z\in N, T(z)\to U(z)}{\Delta}\right]$$

$$\sum_{i=1}^{n}x_i\sum_{j=1}^{n}w_{ij}L'_j = \sum_{i=1}^{n}x_i\left[\frac{\forall y\in N, P(y)\to Q(y)}{\Delta}, \frac{\exists x\in N, R(x)\to S(x)}{\Delta}, \frac{\forall z\in N, T(z)\to U(z)}{\Delta}\right]$$

$$\sum_{i=1}^{n}x_i\sum_{j=1}^{n}w_{ij}L'_j = \left[\sum_{i=1}^{n}x_i\frac{\forall y\in N, P(y)\to Q(y)}{\Delta}, \sum_{i=1}^{n}x_i\frac{\exists x\in N, R(x)\to S(x)}{\Delta}, \sum_{i=1}^{n}x_i\frac{\forall z\in N, T(z)\to U(z)}{\Delta}\right]$$

$$G_{ij} = \sum_{j=1}^{n}w_{ij}L'_j = \sum_{j=1}^{n}\phi_j\chi$$

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$$\sum_{i=1}^{n}x_i\sum_{j=1}^{n}w_{ij}L'_j = \sum_{i=1}^{n}x_i\left[\frac{\forall y\in N, P(y)\to Q(y)}{\Delta}, \frac{\exists x\in N, R(x)\to S(x)}{\Delta}, \frac{\forall z\in N, T(z)\to U(z)}{\Delta}\right]$$

$$G_{ij} = \sum_{j=1}^{n}w_{ij}L'_j = \sum_{j=1}^{n}\phi_j\chi$$

$$f(\mathbf{x}) = x_i\sum_{j=1}^{n}w_{ij}L'_j = \sum_{i=1}^{n}x_i\left[\frac{\forall y\in N, P(y)\to Q(y)}{\Delta}, \frac{\exists x\in N, R(x)\to S(x)}{\Delta}, \frac{\forall z\in N, T(z)\to U(z)}{\Delta}\right]$$

$$f(\mathbf{x}) = \sum_{j=1}^{n}w_{ij}L'_j = \sum_{j=1}^{n}\phi_j\chi$$

With this in mind, we can know interpret the $f(\mathbf{x}) = \sum_{j=1}^{n} w_{ij} L'_j = \sum_{j=1}^{n} \phi_j \chi$ as the reduct of $\mathbf{u}\cdot\mathbf{L}'(x_i)\cdot G = \left[\sum_{y\in N}\prod_{y\to\infty}\psi_y^2, \left(\prod_{x\in N}\frac{\frac{\partial\phi(\mathbf{y}_x)}{\partial y_j}a_j}{\Delta}\right)\sum_{x\in N}\sum_{x\to\infty}\theta_x^2, \int_{z\in N}\int_{z\to\infty}\omega_z^2\right].$

$$\mathbf{u}\cdot\mathbf{L}'(x_i)\cdot G = \left[\sum_{y\in N}\prod_{y\to\infty}\psi_y^2, \left(\prod_{x\in N}\frac{\frac{\partial\phi(\mathbf{y}_x)}{\partial y_j}a_j}{\Delta}\right)\sum_{x\in N}\sum_{x\to\infty}\theta_x^2, \int_{z\in N}\int_{z\to\infty}\omega_z^2\right].$$

$$f(\mathbf{x}) = \left[\sum_{y\in N}\prod_{y\to\infty}\psi_y^2, \left(\prod_{x\in N}\frac{\frac{\partial\phi(\mathbf{y}_x)}{\partial y_j}a_j}{\Delta}\right)\sum_{x\in N}\sum_{x\to\infty}\theta_x^2, \int_{z\in N}\int_{z\to\infty}\omega_z^2\right].$$

$$f(\mathbf{x}) = \left[\sum_{y\in N}\prod_{y\to\infty}\psi_y^2, \left(\left(\prod_{x\in N}\frac{\frac{\partial\phi(\mathbf{y}_x)}{\partial y_j}a_j}{\Delta}\right)\sum_{x\in N}\sum_{x\to\infty}\theta_x^2\right), \int_{z\in N}\int_{z\to\infty}\omega_z^2\right].$$

What happens when we reduce two different dimensionality?

$$n^p + m^p = a^p$$

$$j^k + i^k = b^k$$

$$n^p + m^p = a^p$$

$$\left(j^k + i^k = b^k\right)$$

$$(jij_2i_2 + jij_2i_2 = bbb_2b_2)\,(nmn_2m_2 + nmn_2m_2 = aaa_2a_2)$$

$$(jij_2i_2 = bbb_2b_2)\,(nmn_2m_2 = aaa_2a_2)$$

$$(jij_2i_2 = bbb_2b_2)\,(nmn_2m_2 = aaa_2a_2)$$

The magnitude of a vector is the square root of the elements raised to the power of 2.

$$|\forall\langle\phi,\chi,\psi,\cdot\rangle| = \sqrt[2]{\sum_{j=1}^{n}\left[\frac{\forall y\in N, P(y)\to Q(y)}{\Delta}, \frac{\exists x\in N, R(x)\to S(x)}{\Delta}, \frac{\forall z\in N, T(z)\to U(z)}{\Delta}\right]}$$

$$|\forall\langle\phi,\chi,\psi,\cdot\rangle| = \sqrt[2]{\sum_{j=1}^{n}\left[\frac{\forall y\in N, P(y)\to Q(y)}{\Delta}, \frac{\exists x\in N, R(x)\to S(x)}{\Delta}, \frac{\forall z\in N, T(z)\to U(z)}{\Delta}\right]}.$$

$$|f(\mathbf{x}) = \left[\sum_{y\in N}\prod_{y\to\infty}\psi_y^2, \left(\prod_{x\in N}\frac{\frac{\partial\phi(\mathbf{y}_x)}{\partial y_j}a_j}{\Delta}\right)\sum_{x\in N}\sum_{x\to\infty}\theta_x^2, \int_{z\in N}\int_{z\to\infty}\omega_z^2\right]| = \sqrt[2]{\sum_{j=1}^{n}\left[\frac{\sum_{y\in N}\prod_{y\to\infty}\psi_y^2}{\Delta}, \frac{\sum_{x\in N}\sum_{x\to\infty}\theta_x^2}{\Delta}, \frac{\int_{z\in N}\int_{z\to\infty}\omega_z^2}{\Delta}\right]}.$$

$$f(\mathbf{x}) = \left[\sum_{y\in N}\prod_{y\to\infty}\psi_y^2, \left(\prod_{x\in N}\frac{\frac{\partial\phi(\mathbf{y}_x)}{\partial y_j}a_j}{\Delta}\right)\sum_{x\in N}\sum_{x\to\infty}\theta_x^2, \int_{z\in N}\int_{z\to\infty}\omega_z^2\right].$$

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$$\min x Ł^2\left(\frac{\partial^2 f}{\partial x^2}\right) = \sum_{i=1}^{n}\left(\sum_{j=1}^{n} Ł^2\left(x_{ij}\cdot\mathbf{w}_{ij}\right)\right) \tag{3}$$

$$f(\mathbf{x}) = \sum_{i,j=1}^{n}\left(\sum_{j=1}^{n} w_{ij}L'_j\right)$$

$$\min x Ł^2\left(\frac{\partial^2 f}{\partial x^2}\right) = \sum_{i=1}^{n}\sum_{j=1}^{n}\left(\left(\sum_{k=1}^{2}\mathrm{Logistic}(x_{ik})\mathbf{w}_{kj}\right) + b_j\right)^2 \tag{4}$$

$$\min Ł^2\left(\frac{\partial^2 f}{\partial x^2}\right) = \sum_{j=1}^{n}\left(\sum_{k=1}^{n}\left(\sum_{x=1}^{2}\mathrm{Logistic}(x_{ik})\mathbf{w}_{kj}\right) + b_j\right)^2 \tag{5}$$

$$\min Ł^2\left(\frac{\partial^2 f}{\partial x^2}\right) = \sum_{j=1}^{n}\left(\sum_{k,x=1}^{2}(\mathrm{Logistic}(x_{ik})\mathbf{w}_{kj}) + b_j\right)^2 \tag{6}$$

$$\min Ł^2\left(\frac{\partial^2 f}{\partial x^2}\right) = \sum_{j=1}^{n}\sum_{k,x=1}^{2}((\mathrm{Logistic}(x_{ik})\mathbf{w}_{kj}) + b_j)^2 \tag{7}$$

$$\min Ł^2\left(\frac{\partial^2 f}{\partial x^2}\right) = \sum_{j,k,x=1}^{2}((\mathrm{Logistic}(x_{ik})\mathbf{w}_{kj}) + b_j)^2 \tag{8}$$

$$\min f = \sum_{j=1}^{n}\sum_{k=1}^{n}\left(\left(\sum_{x=1}^{2}\text{Logistic}(x_{ik})\mathbf{w}_{kj}\right)+b_j\right) \tag{9}$$

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$$Ł^2\left(\frac{\partial^2 f}{\partial x^2}\right) = \sum_{j=1}^{n}\left(\sum_{k=1}^{n}\left(\sum_{x=1}^{2}\text{Logistic}(x_{ik})\mathbf{w}_{kj}\right)+b_j\right)^2$$

$$Ł^2\left(\frac{\partial^2 f}{\partial x^2}\right) = \sum_{j=1}^{n}\sum_{k=1}^{n}\left(\sum_{x=1}^{2}(\text{Logistic}(x_{ik})\mathbf{w}_{kj})+b_j\right)^2$$

$$Ł^2\left(\frac{\partial^2 f}{\partial x^2}\right) = \sum_{j=1}^{n}\sum_{k=1}^{n}\left(\sum_{x=1}^{2}\text{Logistic}\left(x_{ik}\right)\mathbf{w}_{kj}+b_j\right)^2$$

$$Ł^2\left(\frac{\partial^2 f}{\partial x^2}\right) = \sum_{j=1}^{n}\sum_{k=1}^{n}\left(\text{Logistic}\left(x_{ik}\right)\sum_{x=1}^{2}\mathbf{w}_{kj}+b_j\right)^2$$

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$$Ł^2\left(\frac{\partial^2 f}{\partial x^2}\right) = \sum_{j,k=1}^{n}\left(\text{Logistic}\left(\mathbf{x}_{jk}\right)\mathbf{w}_{jk}+b_j\right)^2$$

$$Ł^2\left(\frac{\partial^2 f}{\partial x^2}\right) = \sum_{j,k,x=1}^{2}\left(\text{Logistic}\left(\mathbf{x}_{jk}\right)\mathbf{w}_{jk}+b_j\right)^2$$

$$Ł^2\left(\frac{\partial^2 f}{\partial x^2}\right) = \sum_{j,k,x=1}^{2}\left(\frac{\mathbf{x}_{jk}-\mathbf{w}_{jk}}{1+e^{-\mathbf{x}_{jk}}}+b_j\right)^2$$

$$Ł^2\left(\frac{\partial^2 f}{\partial x^2}\right) = \sum_{j,k,x=1}^{2}\left(\frac{\mathbf{x}_{jk}-\mathbf{w}_{jk}}{1+e^{-\mathbf{x}_{jk}}}+b_j\right)^2$$

$$Ł^2\left(\frac{\partial^2 f}{\partial x^2}\right) = \sum_{j,k,x=1}^{2}\left(\frac{\mathbf{x}_{jk}-\mathbf{w}_{jk}}{1+e^{-\mathbf{x}_{jk}}}+b_j\right)^2 \tag{11}$$

$$f(\mathbf{x}) = \frac{\frac{\partial\phi(\mathbf{y}_x)}{\partial y_j}a_j}{\Delta}\sum_{x\in N}\sum_{x\to\infty}\theta_x^2 \tag{12}$$

The regularity of a function is 1 if there is a function f such that $D(x)i(x)+(f(x)\psi$

Using the solution to the function $f(x) = I(x) + (f(x)\frac{\partial(i(x))}{\partial x})$ is:

$$(f(x) = I(x) + (f(x)\frac{\partial(i(x))}{\partial x})$$

$$f(\mathbf{x}) = \left[\sum_{y\in N}\prod_{y\to\infty}\psi_y^2, \left(\prod_{x\in N}\frac{\frac{\partial\phi(\mathbf{y}_x)}{\partial y_j}a_j}{\Delta}\right)\sum_{x\in N}\sum_{x\to\infty}\theta_x^2, \int_{z\in N}\int_{z\to\infty}\omega_z^2\right]. \tag{13}$$

2 An Interpretation of Step Size in the Learning Rate

If we assume that the the hypothesis is a function a the changing step size using the following input:

$$\Delta\alpha = \frac{\frac{\partial\phi(\mathbf{y}_x)}{\partial y_j}a_j}{\Delta}$$

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$$\Delta\alpha = \frac{\frac{\partial\phi(\mathbf{y}_x)}{\partial y_j}a_j}{\Delta} \tag{14}$$

$$\Delta\alpha = \frac{\frac{\partial\phi(\mathbf{y}_x)}{\partial y_j}a_j}{\Delta} \tag{15}$$

so that the formula for the hypothesis is:

$$f(\mathbf{x}) = \mathbf{x}^T\cdot\mathbf{w}+b \tag{16}$$

then the solution to Linear regression is:

$$\rho = \min\sum\left(f(\mathbf{x}_i)-y_i\right)^2 \tag{17}$$

We can interpolate the hypothesis by a solution to an arbitrary cost function as follows:

$$\min\ f(\mathbf{x}) = \sum_{i=1}^{n} \sum_{j=1}^{2} \left(m \cdot \text{Logistic}\left(\mathbf{x}_{ij}\right) \mathbf{w}_{ij} + b_j\right)^2 \tag{18}$$

$$\min\ f(\mathbf{x}) = \sum_{i=1}^{n} \sum_{j=1}^{2} \sum_{x=1}^{2} \left(m \cdot \text{Logistic}\left(\mathbf{x}_{ij}\right) \mathbf{w}_{ij} + b_j\right)^2 \tag{19}$$

$$\min\ F(\mathbf{x}) = \sum_{i=1}^{n} \sum_{j=1}^{2} \sum_{x=1}^{2} \left(m \cdot \text{Logistic}\left(\mathbf{x}_{ij}\right) \mathbf{w}_{ij} + b_j\right)^2 \tag{20}$$

$$\min\ f(\mathbf{x}) = \sum_{i=1}^{n} \sum_{j=1}^{2} \sum_{x=1}^{2} \left(\text{Logistic}\left(\mathbf{x}_{ij}\right) \mathbf{w}_{ij} + b_j\right)^2 \tag{21}$$

$$\min\ f(\mathbf{x}) = \sum_{i=1}^{n} \sum_{j=1}^{2} \sum_{x=1}^{2} \left(\text{Logistic}\left(\mathbf{x}_{ij}\right) \mathbf{w}_{ij} + b_j\right)^2 \tag{22}$$

$$\min\ Ł^2 \left(\frac{\partial^2 f}{\partial x^2}\right) = \sum_{j=1}^{n} \sum_{k=1}^{n} \sum_{x=1}^{2} \left(\text{Logistic}\left(\mathbf{x}_{ik}\right) \mathbf{w}_{kj} + b_j\right)^2 \tag{23}$$

$$\rho = \min \sum \left(f(\mathbf{x}_i) - y_i\right)^2 \tag{24}$$

$$\rho = \min \sum \left(f(\mathbf{x}_i) - y_i\right)^2 \tag{25}$$

$$\rho = \min \sum \left(\mathbf{x}_i^T \cdot \mathbf{w} + b - y_i\right)^2 \tag{26}$$

$$\theta = \left(\sum_{i=1}^{n} \mathbf{x}^T \cdot \left(\text{Logistic}\left(\mathbf{x}_{ik}\right) \mathbf{w}_{kj} + b_j\right)^2\right) \cdot \frac{1}{n} \tag{27}$$

$$\theta = \left(\sum_{i=1}^{n} \mathbf{x}^T \cdot \left(\text{Logistic}\left(\mathbf{x}_{ik}\right) \mathbf{w}_{kj} + b_j\right)^2\right) \cdot \frac{1}{n} \tag{28}$$

$$\theta = \left(\sum_{i=1}^{n} \mathbf{x}^T \cdot \mathbf{x}\left(\text{Logistic}\left(\mathbf{x}_{ik}\right) \mathbf{w}_{kj} + b_j\right)^2\right) \cdot \frac{1}{n} \tag{29}$$

$$\mathbf{e} = \frac{\sum_{i=1}^{n} \mathbf{a}_i}{\sum_{j=1}^{m} \mathbf{b}_j}$$

$$\mathbf{e} = \frac{\sum_{i=1}^{n} \mathbf{a}_i}{\sum_{j=1}^{m} \mathbf{b}_j}$$

$$\theta = \left(\sum_{j=1}^{m} \text{Logistic}\left(\mathbf{x}_{kj}\right)\mathbf{w}_{kj} + b_j\right)\left(\sum_{x=1}^{2}\left(\text{Logistic}\left(\mathbf{x}_{ik}\right)\mathbf{w}_{kj} + b_j\right)^2 \cdot \frac{1}{n}\right)^2$$

(30)

$$\theta = \left(\sum_{j=1}^{m} \text{Logistic}\left(\mathbf{x}_{kj}\right)\mathbf{w}_{kj} + b_j\right)\left(\sum_{x=1}^{2}\sum_{i=1}^{n}\left(\text{Logistic}\left(\mathbf{x}_{ik}\right)\mathbf{w}_{kj} + b_j\right)^2 \cdot \frac{1}{n}\right)^2$$

(31)

$$\mathbf{f} = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n}\mathbf{a}_i\mathbf{b}_j}{\sum_{k=1}^{m}\sum_{l=1}^{m}\mathbf{c}_k\mathbf{d}_l}$$

$$\mathbf{f} = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n}\mathbf{a}_i\mathbf{b}_j}{\sum_{k=1}^{m}\sum_{l=1}^{m}\mathbf{c}_k\mathbf{d}_l}$$

$$\mathbf{f} = \frac{\sum_{i,j=1}^{n}\sum_{k,l=1}^{m}\mathbf{a}_i\mathbf{b}_j\mathbf{c}_k\mathbf{d}_l}{\sum_{k,l=1}^{m}\mathbf{c}_k\mathbf{d}_l}$$

$$\mathbf{f} = \frac{\sum_{i,j=1}^{n}\sum_{k,l=1}^{m}\mathbf{a}_i\mathbf{b}_j\mathbf{c}_k\mathbf{d}_l}{\sum_{c,d=1}^{m}\mathbf{c}_c\mathbf{d}_d}$$

$$f(\mathbf{x}) = \left[\sum_{y\in N}\prod_{y\to\infty}\psi_y^2, \left(\prod_{x\in N}\frac{\frac{\partial\phi(\mathbf{y}_x)}{\partial y_j}a_j}{\Delta}\right)\sum_{x\in N}\sum_{x\to\infty}\theta_x^2, \int_{z\in N}\int_{z\to\infty}\omega_z^2\right]. \tag{32}$$

$$(i(t), y(t), y(t))\left(\text{Logistic}\left(\mathbf{X}_{ij}\right)\mathbf{w}_{kj} + b_j\right)^2 =$$

$$\left(\sum_{y\in N}\prod_{y\to\infty}\psi_y^2, \left(\prod_{x\in N}\frac{\frac{\partial\phi(\mathbf{y}_x)}{\partial y_j}a_j}{\Delta}\right)\sum_{x\in N}\sum_{x\to\infty}\theta_x^2, \int_{z\in N}\int_{z\to\infty}\omega_z^2\right)\left(\sum_{x=1}^{2}\left(\text{Logistic}\left(\mathbf{x}_{ik}\right)\mathbf{w}_{kj} + b_j\right)^2\right).$$

$$(i(t), y(t), y(t)\to\infty)\left(\sum_{x=1}^{2}\left(\frac{\mathbf{x}_{ik} - \mathbf{w}_{kj}}{1 + e^{-\mathbf{x}_{ik}}} + b_j\right)^2\right) =$$

$$\left[\sum_{y\in N}\prod_{y\to\infty}\psi_y^2, \left(\prod_{x\in N}\frac{\frac{\partial\phi(\mathbf{y}_x)}{\partial y_j}a_j}{\Delta}\right)\sum_{x\in N}\sum_{x\to\infty}\theta_x^2, \int_{z\in N}\int_{z\to\infty}\omega_z^2\right]\left(\sum_{x=1}^{2}\left(\frac{\mathbf{x}_{ik} - \mathbf{w}_{kj}}{1 + e^{-\mathbf{x}_{ik}}} + b_j\right)^2\right).$$

$$\left[\sum_{y\in N}\prod_{y\to\infty}\psi_y^2, \left(\prod_{x\in N}\frac{\frac{\partial\phi(\mathbf{y}_x)}{\partial y_j}a_j}{\Delta}\right)\sum_{x\in N}\sum_{x\to\infty}\theta_x^2, \int_{z\in N}\int_{z\to\infty}\omega_z^2\right]\left(\sum_{x=1}^{2}\left(\text{Logistic}\left(\sum_{y\in N}\mathcal{D}\psi_y\right)\mathbf{w}_{kj}+b_j\right)^2\right).$$

$$\sum_{j=1}^{n}\left(\sum_{k=1}^{2}\left(\sum_{x=1}^{2}\frac{\mathbf{x}_{ik}-\mathbf{w}_{kj}}{1+e^{-\mathbf{x}_{ik}}}+b_j\right)^2\right)=$$

$$\sum_{y\in N}\left(\prod_{y\to\infty}\psi_y^2\right)\left(\sum_{x\in N}\sum_{x\to\infty}\theta_x^2\right)\left(\int_{z\in N}\int_{z\to\infty}\omega_z^2\right)$$

$$\sum_{j=1}^{n}\left(\sum_{k=1}^{2}\left(\sum_{x=1}^{2}\frac{\mathbf{x}_{ik}-\mathbf{w}_{kj}}{1+e^{-\mathbf{x}_{ik}}}+b_j\right)^2\right)=$$

$$\sum_{y\in N}\sum_{x\in N}\sum_{z\in N}\sum_{x\to\infty}\sum_{z\to\infty}\sum_{y\to\infty}\left(\mathbf{x}_{ik}-\mathbf{w}_{kj}\right)^2\left(1+e^{-\mathbf{x}_{ik}}\right)^{-2}(\psi_y\theta_x\omega_z)^2+b_j^2$$

or $\sum_{j=1}^{n}\left(\sum_{k=1}^{2}\mathbf{x}_{ik}\mathbf{w}_{kj}-\mathbf{w}_{kj}+b_j\right)^2$
or

$$\sum_{j=1}^{n}\left(\sum_{k=1}^{2}\mathbf{x}_{ik}\mathbf{w}_{kj}-\mathbf{w}_{kj}+b_j\right)^2$$

3 Descent for Linear Example

The starting point for the function $f(x) = \alpha x + b$ is:

$$J(\alpha, b) = \frac{1}{m} \sum_{i=1}^{m} \left(\alpha x^{(i)} + b - y^{(i)} \right)^2 \tag{33}$$

Applying the chain rule to calculate the gradient, we can show the following result:

$$\frac{\partial J(\alpha, b)}{\partial \alpha} = \frac{2}{m} \sum_{i=1}^{m} \left(\alpha x^{(i)} + b - y^{(i)} \right) x^{(i)} \tag{34}$$

$$\frac{\partial J(\alpha, b)}{\partial b} = \frac{2}{m} \sum_{i=1}^{m} \left(\alpha x^{(i)} + b - y^{(i)} \right) \tag{35}$$

The update rules for α and b respectively are:

$$\alpha := \alpha - \frac{\partial J(\alpha, b)}{\partial \alpha} \tag{36}$$

$$b := b - \frac{\partial J(\alpha, b)}{\partial b} \tag{37}$$