1. Consider $G(E_n)$ - geometric algebra upon n-dimensional eucliden vector space.

Consider 2 linear subspaces:

columns of matrices $X = \|\vec{x}_1 \dots \vec{x}_m\|$ and $Y = \|\vec{y}_1 \dots \vec{y}_p\|$

$\vec{x}_1 \wedge \dots \wedge \vec{x}_m \neq 0$ (assuming linear independency of $\vec{x}_1 \dots \vec{x}_m$)

and $\vec{y}_1 \wedge \dots \wedge \vec{y}_p \neq 0$ (assuming linear independency of $\vec{y}_1 \dots \vec{y}_p$)

~~Let p < m for determ~~

2. Consider a vector $\vec{c} \in \mathrm{Lin}\{\vec{x}_1 \dots \vec{x}_m\}$ and a vector $\vec{d} \in \mathrm{Lin}\{\vec{y}_1 \dots \vec{y}_p\}$. In terms of outer product, this can be written as:

$$\vec{c} \wedge (\vec{x}_1 \wedge \dots \wedge \vec{x}_m) = 0$$

$$\vec{d} \wedge (\vec{y}_1 \wedge \dots \wedge \vec{y}_p) = 0$$

3. For a given $\vec{c}$, we can find such $\vec{d}$ that it would ~~min~~maximize the normalized inner product:

$$\underset{\substack{\vec{d} \in \mathrm{Lin}\{\vec{y}_1 \dots \vec{y}_p\} \\ \vec{d}^2 = 1}}{\arg\max} \frac{\vec{c} \rfloor \vec{d}}{\sqrt{\vec{c}^2}} = \frac{P_{\vec{y}_1 \wedge \dots \wedge \vec{y}_p}(\vec{c})}{\sqrt{\left(P_{\vec{y}_1 \wedge \dots \wedge \vec{y}_p}(\vec{c})\right)^2}},$$

where $P_{\vec{y}_1 \wedge \dots \wedge \vec{y}_p}(\vec{c}) = \left(\vec{c} \rfloor (\vec{y}_1 \wedge \dots \wedge \vec{y}_p)\right) \rfloor (\vec{y}_1 \wedge \dots \wedge \vec{y}_p)^{-1}$ - orthogonal projection of $\vec{c}$ onto $\mathrm{Lin}\{\vec{y}_1 \dots \vec{y}_p\}$

4. Finally, the goal is to obtain $\vec{c}$ in $\mathrm{Lin}\{\vec{x}_1 \ldots \vec{x}_m\}$, such that it would maximize the normalized inner product with its own orthogonal projection:

$$c_1 = \underset{\substack{\vec{c} \in \mathrm{Lin}\{\vec{x}_1 \ldots \vec{x}_m\} \\ \vec{c}^2 = 1}}{\operatorname{argmax}} \frac{\vec{c} \rfloor P_{\vec{y}_1 \ldots \vec{y}_p}(\vec{c})}{\sqrt{\left(P_{\vec{y}_1 \ldots \vec{y}_p}(\vec{c})\right)^2}}, \quad \vec{d}_1 = P_{\vec{y}_1 \ldots \vec{y}_p}(\vec{c}_1) \Big/ \sqrt{P^2_{\ldots}}$$

or, alternatively,

$$d_1 = \underset{\substack{\vec{d} \in \mathrm{Lin}\{\vec{y}_1 \ldots \vec{y}_p\} \\ \vec{d}^2 = 1}}{\operatorname{argmax}} \frac{\vec{d} \rfloor P_{\vec{x}_1 \ldots \vec{x}_m}(\vec{d})}{\sqrt{\left(P_{\vec{x}_1 \ldots \vec{x}_m}(\vec{d})\right)^2}}. \quad \vec{c}_1 = P_{\vec{x}_1 \ldots \vec{x}_m}(\vec{d}_1) \Big/ \sqrt{P^2_{\ldots}}$$

5. Upon obtaining a pair $(\vec{c}_1, \vec{d}_1)$, we can repeat steps 2-4 changing $\vec{x}_1 \wedge \ldots \wedge \vec{x}_m$ to $c_1 \rfloor (\vec{x}_1 \wedge \ldots \wedge \vec{x}_m)$ - orthogonal complement of $\vec{c}_1$ in $\vec{x}_1 \wedge \ldots \wedge \vec{x}_m$; and $\vec{y}_1 \wedge \ldots \wedge \vec{y}_p$ to $\vec{d}_1 \rfloor (\vec{y}_1 \wedge \ldots \wedge \vec{y}_p)$.

$\vec{c}_2$ is orthogonal to $\vec{c}_1$

As a result, we will obtain a pair $(\vec{c}_2, \vec{d}_2)$; $\vec{c}_1 \vec{c}_2 = \vec{c}_1 \wedge \vec{c}_2$, $\vec{d}_1 \vec{d}_2 = \vec{d}_1 \wedge \vec{d}_2$. Steps 2-4 then can be repeated once again, and again, up to $\min\{m, p\}$ times in total.

6. Statement: this process is equivalent to Canonical Correlation Analysis, more precisely, $\vec{c}_i = X\vec{a}_i$, $\vec{d}_i = Y\vec{b}_i$ $(i = 1 \ldots \ell \leq \min\{m, p\})$, where pairs $(\vec{a}_i, \vec{b}_i)$ are obtained in CCA.