Paper: **Evolving Deep Convolutional Neural Networks by Variable-length Particle Swarm Optimization for Image Classification**

**Introduction**

**No. of paragraphs: 4**

**Paragraph no.1**

By applying the same architecture on various tasks, one cannot accept the optimal results.

**Paragraph no.2**

Evolutionary computation has recently been leveraged to automatically design the architecture without any human effort evolved, can solve the complex problem of CNN. Automatic design of CNN have done by Genetic Programming.

**Paragraph no.3**

During the fitness evaluation in **EvoCNN** each individual train by only 10 epochs that speed up the learning process.

**Paragraph no.4**

There some advantage of PSO (Particle Swarm Optimization)

1. Easy implementation
2. Lower computational cost
3. Fewer parameters to adjust

**Goal**

**No. of paragraphs: 3**

**Paragraph no.1**

Here develop a new PSO algorithm based on the novel encoding strategy.

**Paragraph no.2**

Here talk about to break the constraint of the fix length encoding.

**Paragraph no.3**

Here proposed a fitness evaluation method by using kind of dataset.

**CNN Architecture**

**No. of paragraphs: 1**

**Paragraph no.1**

General architecture of a CNN have different types of layers, have different configuration **like:** Filter size, stride size, feature maps.

**Particle Swarm Optimization**

**No. of paragraphs: 1**

**Paragraph no.1**

**PSO** motivated by social behavior of bird flocking. Commonly used for solving optimization problems without rich domain knowledge. Find the best solution by updating **velocity** and **particle vector** according to some equation.

**Internet Protocol Address**

**No. of paragraphs: 2**

**Paragraph no.1**

**IP** address use the Internet Protocol for communication. **IP** address used for identifying the host and **subnet** used for distinguished different networks are carried by a network interface.

**Paragraph no.2**

About **binary strings,** that suits the requirement of encoding **CNN** layers to particles. Binary string can be divided into several **bytes,** and each byte comprise one dimension of the particle vector. To gain the flexibility of encoding various types of layers into a particle, and drastically cut down the learning process, there some kind of idea is presented.