A C++ library based on local maximum-entropy approximation schemes to solve linear and nonlinear elasticity problem is presented. The available tools and several implementation details are mentioned. Selected numerical examples are shown in order to illustrate the capabilities of the library. The current and future developments are indicated.

**Abstract**

To create an efficient, robust, flexible and totally controllable tool to attack problems of mechanics such as multiscale modeling, model reduction, quasi-continuum methods, and variational adaptivity in meshfree methods.

**Main Features of the Library**

- Local maximum-entropy approximation schemes
- Linear and nonlinear elasticity analysis
- Direct and (linear and nonlinear) iterative solvers
- Optimization algorithms
- Automatic documentation generation (Doxygen)
- Efficient data structure
- Parallel computing algorithms
- Preprocessing tools
- Compilation facilities

**Example of Linear Elasticity**

Cantilever beam subjected to a parabolic distribution of tractions at one end and built-in boundary conditions at the other end.

**Example of Nonlinear Elasticity**

Hyper-elastic block of neo-Hookean material subject to 70% compression.

Long slender column of neo-Hookean material subject to compression. A buckling effect appears.

**Work in Progress**

- $r$-adaptation and optimization of local maximum-entropy shape functions support at each node
- Local-node numerical integration schemes
- Applications of manifold processed from scattered points to surface denoising and thin shell analysis

**References**
