SPOTless

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Abstract

SPOTless is a tool for authors of MATLAB toolboxes which rely on conic optimization. It provides tools for posing problems to modern interior point SDP solvers such as SeDuMi [**?**] and SDPT3 [**?**]. The design of the toolbox is focused on providing ease for manipulating the objects involved in a problem definition programmatically, and efficiency in creating many related conic constraints simultaneously. SPOTless consists of a reduced symbolic polynomial library which uses floating point representation of coefficients and an engine for constructing conic programs represented by these expressions.

1 Manipulating Polynomials: `msspoly`

The class `msspoly` stores and manipulates multivartie matrix polynomials. `msspoly` are constructed in one of three ways.

```
x = msspoly('x');
y = msspoly('y',3);
z = msspoly('z',[3 4]);
```

Here `x` will be an `1-by-1` matrix with a single scalar element whose name is `'x'`.

The following functions behave much as would be expected in any symbolic library:

1. Arithmetic: `diag, imag, minus, mpower, mtimes, plus, power, real, subs, sum, times, trace, uminus, uplus`.
2. Array Manipulation: `ctranspose, horzcat, isempty, length, repmat, reshape, size, subsasgn, subsref, transpose, vertcat`.

A caveat is that `subsasgn` will not expand the size of a

2 Constructing Conic Programs