tuneKernel

Tunes kernel hyperparameters of GPR model. Dismiss tuning for each kernel parameter by setting corresponding bounds to equal values.

Syntax

```
Mdl = tuneKernel(Mdl, verbose)
```

Description

Mdl = tuneKernel(Mdl, verbose) solves the negative marginal logarithmic likelihood criteria with fmincon solver.

Input Argurments

Mdl model struct.

verbose activates prompt for true or 1. Vice versa for false or 0.

Output Argurments

Mdl optimized hyperparameters and resulting regression model.

Requirements

- Other m-files required: None
- Subfunctions: fmincon, optimoptions, computeTuneCriteria, initKernelParameters
- MAT-files required: None

See Also

- fmincon
- optimoptions
- computeTuneCriteria
- initKernelParameters

```
function Mdl = tuneKernel(Mdl, verbose)

    % define options for minimum search
    options = optimoptions('fmincon', 'Display', 'off', 'Algorithm', 'sqp', ...
        'PlotFcn', {@optimplotx, @optimplotfval});

    % display tuning
    if verbose, options.Display = 'iter'; end

    % setup problem for minimum solver use problem structure to feed fmincon
    problem.solver = 'fmincon';
    problem.options = options;

    % apply bounds to prevent overfitting
    problem.lb = [Mdl.s2fBounds(1) Mdl.slBounds(1)];
    problem.ub = [Mdl.s2fBounds(2) Mdl.slBounds(2)];

    % set sl start value
    problem.x0 = Mdl.theta;
    % apply objective function and start values
    problem.objective = @(x) computeTuneCriteria(x, Mdl);

    % solve problem
    [Mdl.theta] = fmincon(problem);


    % reinit kernel with tuned parameters
    Mdl = initKernelParameters(Mdl);
end
```

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