angles2sinoids

Converts angles (rad or degree) to sine and cosine waves with respect to a period factor which gives the abillity to apstract higher periodicity. Additionally the angles are recalculated according to passed period factor.

Computes sine and cosine by product of angle in rad multiplied by period factor.

$$f_{sin} = \sin(p_f \cdot f_{ang})$$

$$f_{cos} = \cos(p_f \cdot f_{ang})$$

If needed a recomputation of the given angels takes place by computed sinoids.

Syntax

```
[fsin, fcos, fang] = angles2sinoids(fang, rad, pf)
```

Description

[fsin, fcos, fang] = angles2sinoids(fang, rad, pf)computes sinoids from passed angles in rad or degree with respect to periodicity of angles. The flag rad converts input angles from degree to rad if set to false.

Examples

```
fang = linspace(0, 360, 100);
[fsin, fcos, fang] = angles2sinoids(fang, true, 1)
```

Input Argurments

fang is a scalar of vector of angles in rad or degree.

rad is a boolean flag. Input angles are converted to rad if set to false.

pf is a positive integer factor. The period factor describes the periodicity of angles in data.

Output Argurments

fsin is a scalar or vector of sine values corresponding to passed angles with respect of the periodicity of angles.

fcos is a scalar or vector of cosine values corresponding to passed angles with respect of the periodicity of angles.

fang is a scalar or vector of recalculated angles with respect of periodicity.

Requirements

- Other m-files required: sinoids2angles
- Subfunctions: sin, cos
- MAT-files required: None

See Also

- sinoids2angles

Created on December 31. 2020 by Tobias Wulf. Copyright Tobias Wulf 2020.

```
function [fsin, fcos, fang] = angles2sinoids(fang, rad, pf)
```

```matlab
    arguments
        % validate angles as scalar or vector
        fang (:,1) double {mustBeReal}
        % validate rad as boolean flag with default true
        rad (1,1) logical {mustBeNumericOrLogical} = true
        % validate period factor as positive scalar with default 1
        pf (1,1) double {mustBeInteger, mustBePositive} = 1
    end

    % if rad flag is false and angles in degree convert to rad
    if ~rad, fang = fang * pi / 180; end

    % calculate sinoids
    fsin = sin(pf * fang);
    fcos = cos(pf * fang);

    % compute radius
    frad = sqrt(fcos.^2 + fsin.^2);

    % recalculate angles to corrected sinoids in rad
    if nargout > 2, fang = sinoids2angles(fsin, fcos, frad); end
end
```

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