

BSP TOOLBOX

STANDARDS COMPLIANCE SHEET

The purpose of this check-off sheet is to verify that all the functions in the BSP Toolbox comply with a consistent set of standards which have been agreed upon by the toolbox design team. Please fill out one separate sheet for each different function you wish to review. Before a function is added to the toolbox, the function must be reviewed by the author and an external reviewer. Each review should require approximately 15 minutes. The file `Template.m` in the toolbox Documentation subdirectory can serve as a template to develop functions and documentation that complies with this standard.

Name of Reviewer: _____

Function File Name: _____

Function Version: _____

Date of Review: _____

Toolbox Release: _____

I. BEHAVIOR

A. LOOK AND FEEL

- ☐ Function name is appropriate and concisely describes what the function does.
- ☐ Description of input and output variables is clear, concise, and meaningful.
- ☐ Description of the function is clear, accurate, and sufficient.

B. SMART DEFAULT BEHAVIOR

- ☐ Function returns help documentation when called with no input or output arguments.
- ☐ Function returns help documentation when too few input arguments are specified.
- ☐ Function does not display any text messages other than errors and severe warnings.
- ☐ The error messages (if any) use MATLAB's `error` function.
- ☐ The warning messages (if any) use MATLAB's `warning` function.
- ☐ If no output arguments are specified, the function does not return any outputs.

C. PLOTTING

The following criteria only apply to functions that generate one or two plots. The following boxes should all be checked if the function does not generate any plots.

- ☐ If no output is specified, the plot is generated.
- ☐ If an output is specified, the plot is not generated unless specified by the plot flag (pf).

The following only apply when one or more plots are generated.

- ☐ Each plot is displayed in a new window.
- ☐ The function does not affect figures that were created prior to the function call.
- ☐ The first figure is placed in the upper left corner of the screen. (see `FigureSet`)
- ☐ The second figure (if any) is placed in the upper right corner of the screen.
- ☐ No more than two figures are generated by the function. (Subplots are allowed).
- ☐ All axes of the plots are properly labeled. Plot titles are not mandatory.
- ☐ All axes include units (if possible) in parentheses after the axis name (e.g. "Frequency (Hz)").
- ☐ If one of the plots contains a signal, the units of the horizontal axis are time (e.g. sec), not samples.
- ☐ If a stem plot is used, the buds at the top of the stems are a solid color (not the default circles).

II. INTERFACE

A. FUNCTION NAME

- ☐ Function name does not include any abbreviations not listed in the appendix (PSD, ECG, DW).
- ☐ Function name is not already used in another MATLAB toolbox. (use `which` to determine)

B. INPUT AND OUTPUT ARGUMENTS

- ☐ The required input arguments are listed before the optional arguments.

- ☐ The internal input variables have the same name as those listed in the documentation, with an “a” appended at the end of optional arguments (e.g. fsa for sampling rate fs).
- ☐ fs (sample rate) immediately follows the signal arguments (if appropriate).
- ☐ The last optional input argument is 'pf' (plot flag) or 'pt' (plot type), if the function can generate a plot.
- ☐ All flags are binary and the valid values are only 0 or 1.
- ☐ All scalars and vectors (inputs & outputs) have lower case variable names.
- ☐ All matrices (inputs & outputs) have upper case variable names.
- ☐ All outputs vectors (if any), are column vectors.

C. STANDARD VARIABLE NAMES

Many of the functions in the toolbox operate on signals and use common concepts. The following criteria ensure that common input arguments have the same labels. These criteria only apply if the function uses the stated argument. If the function does not use the stated argument, the criterion box should be checked indicating that the function complies with the standard.

- ☐ Input signals: x or xn for multiple signals where n is an integer (e.g. x1, x2, ...).
- ☐ Output signals: y or yn for multiple signals where n is an integer (e.g. y1, y2, ...).
- ☐ Sample rate: fs.
- ☐ Cutoff frequency: fc.
- ☐ Window length: wl.
- ☐ Plot flag: pf.
- ☐ Plot type: pt.
- ☐ Flag suffix: _f (must be used for any variable that serves as a binary flag).
- ☐ Type suffix: _t (must be used for any variable that serves as a type).

III. DOCUMENTATION

- ☐ The longest line in the help documentation does not exceed 70 characters.
- ☐ The MATLAB function declaration is listed on the first line of the file.
- ☐ The help documentation begins on the second line of the file.
- ☐ Sections (1-9) listed below are all present and in the specified order.
- ☐ All sections have three spaces of indentation, unless explicitly stated otherwise (see Sections 1,5 & 6).
- ☐ There is exactly one blank line of separation between each of the sections.
- ☐ Scalar and vector variable names are in lower case, matrix variable names are in upper case.

Section 1: Function Name and Brief Description

- ☐ Follows “FunctionName: Brief description.”
- ☐ This section has no indentation.
- ☐ The name is immediately followed by a colon and then a space.
- ☐ The description ends with a period.
- ☐ The description only spans one line (70 characters).

Section 2: Function Call Syntax

- ☐ Follows “[y1,y2,...] = FunctionName(x1,x2,...);”
- ☐ The output variables are listed in square brackets.
- ☐ The input variables are listed in parentheses
- ☐ Both input and output variables are separated by commas with no spaces.
- ☐ There is one space on each side of the equal sign that separates both sides of the equation.
- ☐ The syntax ends with a semicolon.

Sections 3 & 4: Input and Output Arguments

- ☐ The units of each variable (if any) are specified in parentheses after the description and before the period.
- ☐ The variable descriptions are aligned and begin 3 spaces after the end of the longest variable name.
- ☐ Mandatory arguments follow “Name Description (Unit).”
- ☐ Optional arguments follow “Name Description (Unit). Default = DefaultValue.”
- ☐ Flag and type variables follow “Name Description: 1=Option1 (default), ..., N=OptionN.”.

Section 5: Detailed Function Description

- ☐ Paragraphs (if more than one) are separated by a blank line.
- ☐ Paragraphs are not indented.
- ☐ All full-line equations (if any) have six spaces of indentation.

Section 6: Example

- ❑ This section contains two parts: a problem statement and a code segment.
- ❑ The two parts are separated by a blank line.
- ❑ The problem statement follows the format “**Example: Problem statement.**” (May be several sentences.)
- ❑ The word “Example” is immediately followed by a colon and then a space.
- ❑ Each line of the code segment has six spaces of indentation.
- ❑ The code in the example has exactly one instruction per line, each ended with a semicolon.
- ❑ The code returns the desired output when copied and pasted into the MATLAB command window.

Section 7: References

- ❑ References follow the IEEE-specified format (see the appendix).
- ❑ At least one reference is listed (mandatory).
- ❑ References (if more than one) are separated by a blank line.

Section 8: Version

- ❑ Follows “Version Number Initials” (e.g. “Version 1.00.12 MA”)
- ❑ Each of the three parts is separated by a single space.
- ❑ The first part of the number is the same as the release number.
- ❑ The second and third part of the version number each consists of two digits.
- ❑ The third part indicates the version of the applicable compliance standard (V 1.2 in the example).
- ❑ The initials are indicate function’s original author.

Section 9: See also

- ❑ Section 9 follows the format “**See also interp, resample, ..., and filter.**”
- ❑ The names of the functions referenced are separated by commas, with a space after each comma.
- ❑ The last function name is preceded by the word “and”.
- ❑ All of MathWorks’ function names are in upper case.
- ❑ All BSP function names use mixed case (e.g. “ECGDetectQS”).

IV. APPENDIX

A. ABBREVIATIONS

Input/Output Arguments

x	Input signal	wl	Window length
y	Output signal	_t	Type suffix
fs	Sample rate	_f	Flag suffix
fc	Cutoff frequency	pf	Plot fla

Acceptable Function Name Prefix and Suffix Abbreviations

PSD	Power Spectral Density
ECG	Electrocardiogram
DW	Double Window

B. REFERENCES

The following are examples of correct citations consistent with the IEEE journal requirements.

Books

1. G. O. Young, "Synthetic structure of industrial plastics," in *Plastics*, 2nd ed., vol. 3, J. Peters, Ed. New York: McGraw-Hill, 1964, pp. 15–64.
2. W.-K. Chen, *Linear Networks and Systems*. Belmont, CA: Wadsworth, 1993, pp. 123–135.

Periodicals

3. J. U. Duncombe, "Infrared navigation—Part I: An assessment of feasibility," *IEEE Trans. Electron Devices*, vol. ED-11, pp. 34–39, Jan. 1959.
4. E. P. Wigner, "Theory of traveling-wave optical laser," *Phys. Rev.*, vol. 134, pp. A635–A646, Dec. 1965.
5. E. H. Miller, "A note on reflector arrays," *IEEE Trans. Antennas Propagat.*, to be published.

Articles from Conference Proceedings (published)

6. D. B. Payne and J. R. Stern, "Wavelength-switched passively coupled single-mode optical network," in *Proc. IOOC-ECOC*, 1985, pp. 585–590.

Papers Presented at Conferences (unpublished)

7. D. Ebehard and E. Voges, "Digital single sideband detection for interferometric sensors," presented at the 2nd Int. Conf. Optical Fiber Sensors, Stuttgart, Germany, 1984.

Standards/Patents

8. G. Brandli and M. Dick, "Alternating current fed power supply," U.S. Patent 4 084 217, Nov. 4, 1978.

Technical Reports

9. E. E. Reber, R. L. Mitchell, and C. J. Carter, "Oxygen absorption in the Earth's atmosphere," Aerospace Corp., Los Angeles, CA, Tech. Rep. TR-0200 (4230-46)-3, Nov. 1968.