

# hsrstud — HSR-Stud Style and Macros\*

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## Contents

### 1 Purpose of this package

This package is made for the HSR Studenten organization to provide an easy to use interface to give a more consistent look and feel for the works produced by its the members. A secondary objective of this package is to eliminate the *many* dispersed duplicate .tex files that fill the repositories of the HSR-Stud org.

### 2 Package Options

**dontrenew** Do not renew existing L<sup>A</sup>T<sub>E</sub>X commands and environments. This is useful when the package is loaded on a document that is already partiall written.

**arrowvec** Tells the package to use a vector notation with a small arrow over the variables, as it were handwritten.

**textvecdiff** Disables the “Nabla” or “Del” notation for vector derivatives. Instead the symbols  $\nabla$ ,  $\nabla\cdot$ ,  $\nabla\times$ ,  $\nabla^2$  are be replaced with grad, div, curl and div grad.

### 3 Summary notation

### 4 Default Theming

#### 4.1 Links with hyperref

Colors from [?] see  
<https://intranet.hsr.ch>

```
1 Colors from
2 \cite{bib:hsrcolors} see \
3 \url{https://intranet.hsr.ch}
```

#### 4.2 Source Code with listings

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\*This file describes version v0.1, last revised 2020/04/16.

```

1 int main(int argc, char *argv[], char *envp[]) {
2     std::cout << "hello world" << std::endl;
3 }

1 \begin{lstlisting}[language=C++]
2 int main(int argc, char *argv[], char *envp[]) {
3     std::cout << "hello world" << std::endl;
4 }
5 \end{lstlisting}

```

## 5 Mathematics

### 5.1 Vectors

`\vec`, `\v`, `\vc` Vectors notation. If the option `arrowvec` described in §?? is enabled, the notation with a small arrow over the variable will be used  $\vec{x}$ , otherwise the vector is bold  $\mathbf{x}$ . Takes one option `{\langle letter \rangle}`. `\v` is renamed to `\vaccent` and `\vec` to `\oldvec`.

$$\mathbf{F} = m\mathbf{a} \quad 1 \text{ \[ \texttt{\textcolor{blue}{vec}}{F} = m\texttt{\textcolor{blue}{vec}}{a} \]}$$

`\uvec`, `\uv` Unit vector notation. Takes `{\langle letter \rangle}`. It is implemented in terms of `\vec`, which means that the style is inherited.

$$\hat{\mathbf{x}} = \mathbf{x}/x \quad 1 \text{ \[ \texttt{\textcolor{blue}{uvec}}{x} = \texttt{\textcolor{blue}{vec}}{x}/x \]}$$

#### 5.1.1 Products

`\dotp` Dot product between vectors.

$$\mathbf{u} \cdot \mathbf{v} \quad 1 \text{ \[ \texttt{\textcolor{blue}{vec}}{u}\texttt{\textcolor{blue}{dotp}}\texttt{\textcolor{blue}{vec}}{v} \]}$$

`\crossp`, `\cross` Cross product between vectors.

$$\mathbf{u} \times \mathbf{v} \quad 1 \text{ \[ \texttt{\textcolor{blue}{vec}}{u}\texttt{\textcolor{blue}{cross}}\texttt{\textcolor{blue}{vec}}{v} \]}$$

### 5.2 Matrices and Tensors

`\mtx` Matrix notation. Takes `{\langle letter \rangle}`.

$$J = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} \quad \begin{array}{l} 1 \text{ \[ } \\ 2 \quad \texttt{\textcolor{blue}{mtx}}{J} = \texttt{\textcolor{blue}{begin}}\{\texttt{pmatrix}} \\ 3 \quad \quad 0 \ \& \ 1 \ \backslash \\ 4 \quad \quad 1 \ \& \ 0 \\ 5 \quad \quad \texttt{\textcolor{blue}{end}}\{\texttt{pmatrix}} \\ 6 \text{ \[ } \end{array}$$

`\ten` Tensor notation. Takes `{\langle letter \rangle}`.

$$\mathbf{T}^{(n)} = \hat{\mathbf{n}} \cdot \underline{\sigma} \quad \begin{array}{l} 1 \text{ \[ } \\ 2 \quad \texttt{\textcolor{blue}{vec}}{T}^{\sim}\{(\texttt{\textcolor{blue}{vec}}{n})\} = \\ 3 \quad \texttt{\textcolor{blue}{uvec}}{n}\texttt{\textcolor{blue}{dotp}}\texttt{\textcolor{blue}{ten}}{\texttt{\textcolor{blue}{sigma}}} \\ 4 \text{ \[ } \end{array}$$

## 5.3 Equalities

`\heq` L'Hôpital limit equality symbol.

$$\lim_{x \rightarrow \infty} \frac{x}{x^2 - 1} \stackrel{\text{H}}{=} \lim_{x \rightarrow \infty} \frac{1}{2x} = 0$$

```

1 \[
2   \lim_{x \to \infty} \frac{x}{x^2 - 1}
3   \heq \lim_{x \to \infty} \frac{1}{2x}
4   = 0
5 \]
```

## 5.4 Derivatives

### 5.4.1 Differentials

`\dd` The differential element. It needs a  $\langle var \rangle$  and has the optional argument  $[\langle order \rangle]$ .

$$dx \quad d^4x$$

```

1 \[ \dd{x} \quad \qquad \dd[4]{x} \]
```

`\di` This is the same as `\dd` but with a small space in front, it is intended to be used in integrals for a nicer typesetting.

$$I = \int \mathbf{J} \cdot d\mathbf{s} = \iint \mathbf{J} \cdot \hat{\mathbf{n}} dx dy$$

```

1 \begin{align*}
2   I &= \int \vec{J} \cdot d\vec{s} \\
3   &= \iint \vec{J} \cdot \vec{uvec{n}} \di{x} \di{y}
4 \end{align*}
```

### 5.4.2 Classical

`\deriv` The derivative has arguments  $\langle function \rangle$ ,  $\langle var \rangle$  and the optional argument  $[\langle order \rangle]$ .

$$\frac{dy}{dx} \quad \frac{d^3y}{dx^3}$$

```

1 \[
2   \deriv{y}{x} \quad \qquad \deriv[3]{y}{x}
3
4 \]
```

`\pderiv` The partial derivative has arguments  $\langle function \rangle$ ,  $\langle var \rangle$  and the optional argument  $[\langle order \rangle]$ .

$$\frac{\partial y}{\partial x} \quad \frac{\partial^3 y}{\partial x^3}$$

```

1 \[
2   \pderiv{y}{x} \quad \qquad \pderiv[3]{y}{x}
3
4 \]
```

### 5.4.3 Vector

`\grad` The gradient operator.

$$\nabla f$$

```

1 \[ \grad f \]
```

`\div` The divergence operator, `\div` is renamed to `\divsymb`.

$\nabla \cdot f$	<code>1 \[ \div f \]</code>
------------------	-----------------------------





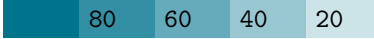



`\curl` The curl operator.

$\nabla \times f$	<code>1 \[ \curl f \]</code>
-------------------	------------------------------

`\laplace` The laplace operator.

$\nabla^2 f$	<code>1 \[ \laplace f \]</code>
--------------	---------------------------------

## 6 Colors

<b>hsr-blue</b>	
<b>hsr-mauve</b>	
<b>hsr-lakegreen</b>	
<b>hsr-reed</b>	
<b>hsr-petrol</b>	
<b>hsr-basswood</b>	
<b>hsr-lightgrey</b>	
<b>hsr-black</b>	

## 7 License

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hsrstud package implementation with inline documentation

## 8 Implementation

### 8.1 Dependencies

```

1 %% Dependencies ((
2 \RequirePackage{amsmath}
3 \RequirePackage{amssymb}
4 \RequirePackage{bm}
5
6 \RequirePackage{esint}
7 \PassOptionsToPackage{b}{esvect}
8 \RequirePackage{esvect}
9

```

```

10 \RequirePackage{xcolor}
11 \RequirePackage{hyperref}
12 \RequirePackage{listings}
13
14 \RequirePackage{iftex}
15 \RequirePackage{kvoptions}
16 %% ))

```

## 8.2 Package options

```

17 \SetupKeyvalOptions{
18     family=hsr,
19     prefix=hsr@
20 }
21
22 %% Enable backwards-compatibility
23 \DeclareBoolOption[false]{legacy}
24
25 %% Do not renew LaTeX Macros
26 \DeclareBoolOption[false]{dontrenew}
27
28 %% Vector style
29 \DeclareBoolOption[false]{arrowvec}
30 \DeclareComplementaryOption{boldvec}{arrowvec}
31
32 %% Vector derivative style
33 \DeclareBoolOption[false]{textvecdiff}
34 \DeclareComplementaryOption{delvecdiff}{textvecdiff}
35
36
37 %% Process options
38 \ProcessLocalKeyvalOptions*

```

## 8.3 Summary notation

```

39 %% TODO: change letters in german
40 \newcommand{\bookref}[1]{\texttt{\textcolor{hsr-mauve}{P.#1}}}
41 \newcommand{\notesref}[1]{\texttt{\textcolor{hsr-blue}{S.#1}}}
42 \newcommand{\lectureref}[1]{\texttt{\textcolor{hsr-lakegreen}{L.#1}}}

```

## 8.4 Default theming

```

43 %% Theming for hyperref and listings ((
44 \hypersetup{
45     colorlinks=true,
46     linkcolor=hsr-black,
47     citecolor=hsr-mauve,
48     filecolor=hsr-black,
49     urlcolor=hsr-blue,
50 }
51
52 %% Common listings settings
53 \lstdefinestyle{hsr-base}{
54     belowcaptionskip=\baselineskip,
55     breaklines=true,
56     frame=none,
57     inputencoding=utf8,
58     % margin
59     xleftmargin=\parindent,
60     % numbers
61     numbers=left,
62     numbersep=5pt,
63     numberstyle=\ttfamily\footnotesize\color{hsr-black40},

```

```

64 % background
65 backgroundcolor=\color{white},
66 showstringspaces=false,
67 % default language
68 language=[LaTeX]TeX,
69 % font
70 basicstyle=\ttfamily\small,
71 identifierstyle=\color{hsr-black},
72 keywordstyle=\color{hsr-blue},
73 commentstyle=\color{hsr-black40},
74 stringstyle=\color{hsr-mauve80},
75 }
76
77 %% Define missing languages / aliases
78 \lstdefinelanguage{LaTeX}{
79     language=[LaTeX]TeX
80 }
81
82 %% Set style
83 \lstset{style=hsr-base, escapechar=`}
84 %%)

```

## 8.5 Mathematics

### 8.5.1 Vectors

```

85 %% Vector ((
86 \newcommand{\hsrvecbold}[1]{\mathbf{\boldsymbol{#1}}}
87 \newcommand{\hsrvecarrow}[1]{\vv{\mathrm{#1}}} % from esvect
88
89 \newcommand{\@hsrvecf}[1]{\hsrvecbold{#1}}
90 \ifhsr@arrowvec
91     \renewcommand{\@hsrvecf}[1]{\hsrvecarrow{#1}}
92 \fi
93
94 \ifhsr@dontrenew
95     \newcommand{\vc}{\@hsrvecf}
96 \else
97     % save previous command
98     \newcommand{\vaccent}{\v}
99     \newcommand{\oldvec}{\vec}
100 % redefine
101 \renewcommand{\v}[1]{\@hsrvecf{#1}}
102 \renewcommand{\vec}[1]{\@hsrvecf{#1}}
103 \fi
104 %%)
105
106 %% Unit vector ((
107 \newcommand{\hsruvecbold}[1]{\vec{\hat{#1}}}
108 \newcommand{\hsruvecarrow}[1]{\hat{\mathrm{#1}}}
109 \newcommand{\@hsruvecf}[1]{\hsruvecbold{#1}}
110 \ifhsr@arrowvec
111     \renewcommand{\@hsruvecf}[1]{\hsruvecarrow{#1}}
112 \fi
113
114 \newcommand{\uv}[1]{\@hsruvecf{#1}}
115 \newcommand{\uvec}[1]{\@hsruvecf{#1}}
116 %%)
117
118 %% Products ((
119 \newcommand{\dotp}{\boldsymbol{\cdot}}
120 \newcommand{\crossp}{\boldsymbol{\times}}

```

```

121 \newcommand{\cross}{\crossp}
122 %%)

```

## 8.5.2 Matrices and Tensors

```

123 \newcommand{\mtx}[1]{\mathrm{#1}}
124 \newcommand{\ten}[1]{\underline{\mathbf{\boldsymbol{#1}}}}

```

## 8.5.3 Equalities

```

125 \newcommand{\heq}{\stackrel{\texttt{H}}{=}}

```

## 8.6 Derivatives

### 8.6.1 Differentials

```

126 \newcommand{\dd}[2][]{\mathrm{d}^{#1} #2}
127 \newcommand{\di}[2][]{\,\mathrm{d}^{#1} #2}

```

### 8.6.2 Derivatives

```

128 \newcommand{\deriv}[3][]{\frac{\dd[#1]{#2}}{\dd[#3]{#1}}}
129 \newcommand{\pderiv}[3][]{\frac{\partial^{#1} #2}{\partial #3^{#1}}}

```

### 8.6.3 Vector derivatives

```

130 %% Gradient ((
131 \ifhsr@textvecdiff
132   \newcommand{\grad}{\text{grad }}
133 \else
134   \newcommand{\grad}{\nabla}%
135 \fi
136 %% ))
137
138 %% Divergence ((
139 \ifhsr@textvecdiff
140   \newcommand{\@hsrdivf}{\text{div }}
141 \else
142   \newcommand{\@hsrdivf}{\nabla\cdot}
143 \fi
144 \ifhsr@dontrenew
145   \newcommand{\divg}{\@hsrdivf}
146 \else
147   \let\divsym=\div
148   \renewcommand{\div}{\@hsrdivf}
149 \fi
150 %% ))
151
152 %% Curl ((
153 \ifhsr@textvecdiff
154   \newcommand{\curl}{\text{curl }}
155 \else
156   \newcommand{\curl}{\nabla\times}
157 \fi
158 %% ))
159
160 %% laplacian ((
161 \ifhsr@textvecdiff
162   \newcommand{\laplace}{\text{div grad }}
163 \else
164   \newcommand{\laplace}{\nabla^2}
165 \fi
166 %% ))

```

## 8.7 Colors

```

167 \definecolor{hsr-blue}{HTML}{0065A3}
168 \definecolor{hsr-blue80}{HTML}{3384B5}
169 \definecolor{hsr-blue60}{HTML}{66A3C8}
170 \definecolor{hsr-blue40}{HTML}{99C1DA}
171 \definecolor{hsr-blue20}{HTML}{CCE0ED}
172
173 \definecolor{hsr-mauve}{HTML}{6E1C50}
174 \definecolor{hsr-mauve80}{HTML}{8B4973}
175 \definecolor{hsr-mauve60}{HTML}{A87796}
176 \definecolor{hsr-mauve40}{HTML}{C5A4B9}
177 \definecolor{hsr-mauve20}{HTML}{E2D2DC}
178
179 \definecolor{hsr-lakegreen}{HTML}{548C86}
180 \definecolor{hsr-lakegreen80}{HTML}{76A39E}
181 \definecolor{hsr-lakegreen60}{HTML}{98BAB6}
182 \definecolor{hsr-lakegreen40}{HTML}{BBD1CF}
183 \definecolor{hsr-lakegreen20}{HTML}{DDE8E7}
184
185 \definecolor{hsr-reed}{HTML}{7B6951}
186 \definecolor{hsr-reed80}{HTML}{958774}
187 \definecolor{hsr-reed60}{HTML}{B0A597}
188 \definecolor{hsr-reed40}{HTML}{CAC3B9}
189 \definecolor{hsr-reed20}{HTML}{E5E1DC}
190
191 \definecolor{hsr-petrol}{HTML}{00738D}
192 \definecolor{hsr-petrol80}{HTML}{338FA4}
193 \definecolor{hsr-petrol60}{HTML}{66ABBB}
194 \definecolor{hsr-petrol40}{HTML}{99C7D1}
195 \definecolor{hsr-petrol20}{HTML}{CCE3E8}
196
197 \definecolor{hsr-basswood}{HTML}{BABD5D}
198 \definecolor{hsr-basswood80}{HTML}{C8CA7D}
199 \definecolor{hsr-basswood60}{HTML}{D6D79E}
200 \definecolor{hsr-basswood40}{HTML}{E3E5BE}
201 \definecolor{hsr-basswood20}{HTML}{F1F2DF}
202
203 \definecolor{hsr-lightgrey}{HTML}{C6C7C8}
204 \definecolor{hsr-lightgrey80}{HTML}{D1D2D3}
205 \definecolor{hsr-lightgrey60}{HTML}{DDDDDE}
206 \definecolor{hsr-lightgrey40}{HTML}{E8E8E9}
207 \definecolor{hsr-lightgrey20}{HTML}{F4F4F4}
208
209 \definecolor{hsr-black}{HTML}{1A171B}
210 \definecolor{hsr-black80}{HTML}{484549}
211 \definecolor{hsr-black60}{HTML}{767476}
212 \definecolor{hsr-black40}{HTML}{A4A2A4}
213 \definecolor{hsr-black20}{HTML}{D1D1D1}

```

## 9 Legacy code

```

214 \ifhsr@legacy
215 %% Makros für Titel, Autor und Datum ((
216 %% Dank diesem Makro stehen Titel, Autor und Datum überall im Dokument zur Verfügung
217 %% Date hat zudem den Default-Wert \today
218 \def\@Title{}
219 \def\@Author{}
220 \def\@Date{\today}
221 \newcommand{\Title}{\@Title}
222 \newcommand{\Author}{\@Author}
223 \newcommand{\Date}{\@Date}
224 \AtBeginDocument{%

```



```

225 \let\@Title\@title
226 \let\@Author\@author
227 \let\@Date\@date
228 }
229 %% ))
230
231 %% Makros für den Arraystretch ((
232 %% bei uns meist in Tabellen genutzt, welche Formeln enthalten
233
234 %% Default Value
235 \def\@ArrayStretchDefault{1} % Entspricht der Voreinstellung von Latex
236
237 %% Setzt einen neuen Wert für den arraystretch
238 \newcommand{\setArrayStretch}[1]{\renewcommand{\arraystretch}{#1}}
239
240 %% Setzt den arraystretch zurück auf den default wert
241 \newcommand{\resetArrayStretch}{\renewcommand{\arraystretch}{\@ArrayStretchDefault}}
242
243 %% Makro zum setzten des Default arraystretch.
244 %% Kann nur in der Präambel verwendet werden.
245 \newcommand{\setDefaultArrayStretch}[1]{%
246 \AtBeginDocument{%
247 \def\@ArrayStretchDefault{#1}
248 \renewcommand{\arraystretch}{#1}
249 }
250 }
251 %% ))
252
253 %% Command for images in table
254 \newcommand\tableimg[2][{}]{%
255 \raisebox{0pt}[dimexpr\totalheight+\dp\strutbox\relax][\dp\strutbox]{%
256 \includegraphics[#1]{#2}%
257 }%
258 }
259
260 %% Makros für Verweise auf ein Buch oder Skript ((
261 \newcommand{\buch}[1]{\texorpdfstring{\textcolor{HSRLakeGreen}{\mbox{\small{#1}}}}{\$}}
262 \newcommand{\buchSeite}[1]{\texorpdfstring{\ensuremath{\textcolor{red}{\mbox{\small{ S #1}}}}}}{\$}}
263 \newcommand{\skript}[1]{\texorpdfstring{\textcolor{HSRReed}{\mbox{\small{#1}}}}{\$}}
264 \newcommand{\formelbuch}[1]{\textcolor{red}{\mbox{\small{S#1}}}}
265 %% ))
266
267 \setlength{\parindent}{0pt}
268
269 %% Todo command
270 \newcommand{\todo}[1]{\textbf{\color{red}{TO DO: #1}}}
271
272 %% Color names ((
273 \colorlet{HSRWhite}{white}
274
275 \colorlet{HSRBlue}{hsr-blue}
276 \colorlet{HSRBlue80}{hsr-blue80}
277 \colorlet{HSRBlue60}{hsr-blue60}
278 \colorlet{HSRBlue40}{hsr-blue40}
279 \colorlet{HSRBlue20}{hsr-blue20}
280
281 \colorlet{HSRLightGray}{hsr-lightgrey}
282 \colorlet{HSRLightGray80}{hsr-lightgrey80}
283 \colorlet{HSRLightGray60}{hsr-lightgrey60}
284 \colorlet{HSRLightGray40}{hsr-lightgrey40}
285 \colorlet{HSRLightGray20}{hsr-lightgrey20}

```

```

286
287 \colorlet{HSRSchwarz}{hsr-black}
288 \colorlet{HSRSchwarz80}{hsr-black80}
289 \colorlet{HSRSchwarz60}{hsr-black60}
290 \colorlet{HSRSchwarz40}{hsr-black40}
291 \colorlet{HSRSchwarz20}{hsr-black20}
292
293 \colorlet{HSRHematite}{hsr-mauve}
294 \colorlet{HSRHematite80}{hsr-mauve80}
295 \colorlet{HSRHematite60}{hsr-mauve60}
296 \colorlet{HSRHematite40}{hsr-mauve40}
297 \colorlet{HSRHematite20}{hsr-mauve20}
298
299 \colorlet{HSRLakeGreen}{hsr-lakegreen}
300 \colorlet{HSRLakeGreen80}{hsr-lakegreen80}
301 \colorlet{HSRLakeGreen60}{hsr-lakegreen60}
302 \colorlet{HSRLakeGreen40}{hsr-lakegreen40}
303 \colorlet{HSRLakeGreen20}{hsr-lakegreen20}
304
305 \colorlet{HSRReed}{hsr-reed}
306 \colorlet{HSRReed80}{hsr-reed80}
307 \colorlet{HSRReed60}{hsr-reed60}
308 \colorlet{HSRReed40}{hsr-reed40}
309 \colorlet{HSRReed20}{hsr-reed20}
310
311 \colorlet{HSRPetrol}{hsr-petrol}
312 \colorlet{HSRPetrol80}{hsr-petrol80}
313 \colorlet{HSRPetrol60}{hsr-petrol60}
314 \colorlet{HSRPetrol40}{hsr-petrol40}
315 \colorlet{HSRPetrol20}{hsr-petrol20}
316
317 \colorlet{HSRBasswood}{hsr-basswood}
318 \colorlet{HSRBasswood80}{hsr-basswood80}
319 \colorlet{HSRBasswood60}{hsr-basswood60}
320 \colorlet{HSRBasswood40}{hsr-basswood40}
321 \colorlet{HSRBasswood20}{hsr-basswood20}
322 %% ))
323
324 \fi %% ifhsr@legacy

```