Errata for “The Structure of Typed Programming Languages”
27 February 1996

Page xiii, Line -12: “Hemerik and Barendregt 1990” should be “Barendregt and Hemerik 1990”.


Page 4, Figure 1.3: Several of the tree arcs should be shifted to the left or to the right.

Page 9, the proof of Theorem 1.5: “Lemma 1.4” should be “Proposition 1.4”.

Page 9, Line -12: “Figure 1.8” should be “Figure 1.4”.

Page 13, Line 12: \texttt{equalint}(m,m) should be \texttt{equalint}(m,n)

Page 16, Line -10: @ loc\textsubscript{1}+4 should be @ loc\textsubscript{2}+4

Page 17, Line -10: Location $\times$ Store $\rightarrow$ Store should be Location $\times$ Store $\rightarrow$ Int.

Page 24, Line 13: loc\textsubscript{1}:=\texttt{(skip)};@ loc\textsubscript{1} should be loc\textsubscript{1}:=\texttt{skip}.

Page 34, Line -2: “C-subtrees” should be “E-subtree”. Also, \texttt{comm} should be \texttt{intexp}.

Page 37, Line 16: loc\textsubscript{1}:=A should be loc\textsubscript{2}:=A

Page 44, Line 17: [V\textsubscript{j}/I\textsubscript{j}]U:\theta should be [V\textsubscript{j}/I\textsubscript{j}]U:\theta. This correction should also be made in the proof that follows.

Page 45, Lines 4-5: $\mid [A@$ loc\textsubscript{2}$; \texttt{fun } B=A+1 \texttt{ in loc\textsubscript{2}:=A+B: comm}]$ should be $[\texttt{loc\textsubscript{2}:=@ loc\textsubscript{2}+(@ loc\textsubscript{2}+1): comm}].$

Page 46, Line 6: $[[\pi U::\theta]]$ should be $[[\pi U::\theta]]$

Page 47, Line 4: \{I::\tau exp\} should be \{I::\tau exp\}\texttt{dec}.

Page 47, Line 10: prog should be \texttt{comm}

Page 47, Line 15: \{B::boolexp\texttt{dec} should be \{B::boolexp\}\texttt{dec}.
Page 48, Line 10: The $\pi$ should be $\emptyset$.

Page 48, Line 23: The conclusion of the inference rule should have $\pi\vdash$.

Page 50, Line 3: The conclusion of the inference rule should have $\pi\vdash$.

Page 50, Lines 21 and 23: The two occurrences of $dec$ in the definitions of $p_1$ and $p_{i+1}$ should be deleted.

Page 51, Line 10: $skip$ should be $skip$.

Page 57, Figure 2.6: The occurrence of $prog$ in the figure should be $comm$.

Page 57, Line -6: A $\vdash$ should be placed in front of $D_2$.

Page 57, last line: $\pi\text{class}$ should be $\pi\text{'class}$, and $\pi\text{dec}$ should be $\pi\text{'dec}$.

Page 58, Line -3: There is a $\pi\vdash$ missing from the conclusion of the inference rule.

Page 76, Line -6: $\text{proc } I$ should be $\text{proc } I_1$.

Page 77, Line -11: $G(1)$ should be $Y(1)$.

Page 79, Line 9: should be $p \in \llbracket \tau \rrbracket \rightarrow \llbracket \text{comm} \rrbracket$.

Page 81, Figure 3.3, penultimate line: $e_3$ should be $e_2$.

Page 81, Line -3: $\text{Int} \rightarrow \text{Store}$ should be $\text{Store} \rightarrow \text{Int}$.

Page 82, Line 2: $\{ I: \theta_2 \}\text{dec}$ should be $\{ I: \theta_1 \rightarrow \theta_2 \}\text{dec}$.

Page 87, Line 16: $A:=0$ should be $R.A:=0$.

Page 89, Line 14: $\text{class } K = (T \cdots)$ should be $\text{class } K(T \cdots)$.

Page 93, Line 4: $\{ I: \tau\text{exp} \}\text{dec}$ should be $\{ I_2: \tau\text{exp} \}\text{dec}$.

Page 93, Line 9: $(I = g)$ should be $(I_1 = g)$.

Page 93, second half of page: A number of occurrences of $\pi\vdash$ are missing.
Page 94, Line -10: V := ⋯ should be U := ⋯

Page 95, Line 12: should be \[[\pi \vdash \text{invoke } I(D) : \theta] e s = ⋯

Page 97, Line 5: should be \[[\pi \vdash I_2 : \theta] e = f, \text{ where } (I_2 = f) \in e

Page 107: first complete paragraph: The first two sentences should read: “In the above example, one location is allocated immediately for global variable A. When P is invoked the first time, a second location is allocated for P’s variable, C.”

Page 117, Line 13: SWAP should be P.

Page 118, Lines 2-4: should be
\[[\pi \vdash \text{inherits } T_1 \text{ with } T_2 : (\pi_1 \cup \pi_2)\text{class}] e s = (e_1 \cup e_2, s_2)
where (e_1, s_1) = \[[\pi \vdash T_1 : \pi_1\text{class}] e s
and (e_2, s_2) = \[[\pi \vdash \pi_1 \vdash T_2 : \pi_2\text{class}] (e \cup e_1) s_1

Page 133, Line 20: should be
\[[\pi \vdash \text{begin } D \text{ in } T \text{ end} : \theta] e s = \[[\pi \vdash \pi_1 \vdash - T : \theta\text{class}] (e \cup e_1) s_1

Page 145: The inference rule for while E_1 do E_2 od requires occurrences of π.

Page 150, Figure 5.6: The equation for application should read:
\[[\pi \vdash E_1 E_2 : \theta_2] e s = (\[[\pi \vdash E_1 : \theta_1 \to \theta_2] e s) (\[[\pi \vdash E_2 : \theta_1] e s) s
(Note the insertion of the store argument, s, for E_1.) The two lines that follow this one should read:
\[[\{ i : \theta_i \} e \}_{\text{eval}} = \text{Store} \to (\{ i : \text{eval}(\theta_i) \} e)_{\bot}
\[[\theta_i \to \theta_2] = \text{Store} \to (\text{eval}(\theta_i) \to \theta_2)_{\bot}
\[[\pi \vdash \text{comm}] = \text{Store} \to \text{Store}_{\bot}
\[[\pi \vdash \text{exp}] = \text{Store} \to \text{\{t\}}_{\bot}


Page 152, Line 13: The third typing rule should read:
\[
\frac{\pi \vdash \text{E : exp}}{\pi \vdash \text{\{I : \tau\}exp}} \text{ where } \tau \in \{\text{intloc}, \pi\}
\]
Page 152, Line -7: "arise"

Page 152, Line -4: The second typing rule should read:
\[
\frac{\pi \vdash E_1 : \tau_1 \rightarrow \tau_2 \exp \quad \pi \vdash E_2 : \tau_1 \exp}{\pi \vdash E_1 \ E_2 : \tau_2 \exp} \quad \text{where } \tau_1 \not\in \{ \text{intloc}, \pi \}
\]

Page 153, Figure 5.7: Delete the fourth and fifth equations from the figure and use instead:
\[
\llbracket \pi \vdash I : \theta \rrbracket e = v, \quad \text{where } (I = v) \in e
\]
The sixth equation should be simplified to:
\[
\llbracket \pi \vdash \text{with } E_1 \ do \ E_2 : \theta \rrbracket e = \llbracket \pi \uplus \pi_1 \vdash \theta \rrbracket e \uplus \llbracket \pi \vdash E_1 : \pi_1 \rrbracket e
\]
The equation on Line 12 should be similarly simplified:
\[
\llbracket \pi \vdash E_1 \ E_2 : \theta_2 \rrbracket e = (\llbracket \pi \vdash E_1 : \theta_1 \rightarrow \theta_2 \rrbracket e) (\llbracket \pi \vdash E_2 : \theta_1 \rrbracket e)
\]
Also, change the equation on Line 13 to read:
\[
\llbracket \pi \vdash E_1 \ E_2 : \tau_2 \exp \rrbracket e \ s = (\llbracket \pi \vdash E_1 : \tau_1 \rightarrow \tau_2 \exp \rrbracket e) (\llbracket \pi \vdash E_2 : \tau_1 \exp \rrbracket e \ s) \ s
\]
Finally, the last six lines of the figure should be replaced by:
\[
\text{where } \llbracket \tau \exp \rrbracket = \text{Store} \rightarrow \llbracket \tau \rrbracket, \\
\text{except } \llbracket \text{intloc } \exp \rrbracket = \text{Store} \rightarrow (\text{Location} \times \text{Store})_{\bot} \\
\text{and } \llbracket \pi \exp \rrbracket = \text{Store} \rightarrow (\llbracket \pi \rrbracket \times \text{Store})_{\bot} \\
\llbracket \theta_1 \rightarrow \theta_2 \rrbracket = \llbracket \theta_1 \rrbracket \rightarrow \llbracket \theta_2 \rrbracket \\
\llbracket \{ i : \theta_i \}_{i \in I} \rrbracket = \{ i : \llbracket \theta_i \rrbracket \}_{i \in I}
\]

Note: Section 5.6, in which the above errors appear, was written in haste, and it shows. It might be best to skip this section.


Page 172, Line -6: \textit{lam} should be \textit{\lambda}.
Page 248, Figure 8.1: The consequents of the second and third inference rules require $\pi \vdash \cdot$.

Page 256, Line -8: The occurrence of :: should be a comma.

Page 334, Exercise 2.3.b: The arity of $g$ should read $g \in (\text{nat} \land \phi_1 \land \phi_2) \Rightarrow \phi_2$.

Page 364, Left column, Line -2: should be ‘list, 75, 94’

Pages 361-361: Some references to items in Chapter 9 are incorrect by -4 pages.

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