Economics and Computation
An Introduction to Algorithmic Game Theory, Computational Social Choice, and Fair Division

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List of Errata

Errata in Chapter 2: Noncooperative Game Theory

Piotr Faliszewski · Irene Rothe · Jörg Rothe

Location	Original text	Corrected text
Page 123, line −4	$\sum_{i \in I} a_i = \sum_{j \in J} a_j$	$\sum_{i \in I'} a_i = \sum_{j \in J'} a_j$
Page 123, line −2	I' and J' are disjoint	I' and J' are distinct
Page 126, line −10	$\sum_{i=1}^{n} < 2^n - 2$	$\sum_{i=1}^{n} a_i < 2^n - 2$
Page 127, line 16	$p(f(x')) \geq p(x)$	$p(f(x')) \geq p(x')$

Errata in Chapter 3: Cooperative Game Theory

Edith Elkind · Jörg Rothe

Location	Original text	Corrected text
Page 147, line 25	for some nonempty set $C \subseteq N$	for some nonempty set $C \subseteq P$
Page 186, line 18	no nonempty coalition $C \subseteq N$	no nonempty coalition $C \subseteq P$
Page 186, line 19	no coalition $C \subseteq N$	no coalition $C \subseteq P$

Errata in Chapter 4: Preference Aggregation by Voting

Dorothea Baumeister · Jörg Rothe

Location	Original text	Corrected text
Page 198, lines 29–32	Formally, a *voting system* can be described by a mapping $$f:\{(C,V)\,\vert\,(C,V) \text{ is a preference profile}\} \rightarrow 2^C,$$ a so-called *social choice correspondence*, where 2^C denotes the *power set of* C, i.e., the set of all subsets of C.	Let C be a set of candidates. Formally, a *voting system* can be described by a so-called *social choice correspondence*, f, that maps each preference profile V over C to a subset of C.
Page 198, line 34 and page 199, lines 1–2	A *social choice function*, $$f:\{(C,V)\,\vert\,(C,V) \text{ is a preference profile}\} \rightarrow C,$$ maps any given preference profile to a single winner.	A *social choice function* maps any given preference profile to a single winner.
Page 199, lines 3–7	A *social welfare function* describes not only how to select a winner or set of winners by a voting system, but even returns a complete ranking of the candidates. This is formalized by a mapping $$f:\{(C,V)\,\vert\,(C,V) \text{ is a preference profile}\} \rightarrow \rho(C),$$ where $\rho(C)$ is a ranking of (or, preference list over) the candidates in C.	A *social welfare function* describes not only how to select a winner or set of winners by a voting system, but even returns a complete ranking of (or, preference list over) the candidates.

Errata in Chapter 7: Cake-Cutting: Fair Division of Divisible Goods

Claudia Lindner · Jörg Rothe

Location	Original text	Corrected text
Page 410, line −4	no other division $Y = \bigcup_{i=1}^{n} Y_i$	no other division $X = \bigcup_{i=1}^{n} Y_i$
Page 440, line 7	an even number of players each	an equal number of players
Page 453, lines −16	16 evaluation requests	nine evaluation requests
Page 453, lines −13 through −7	notice that p_1 and p_2 make two evaluations each in Step 1; p_1, for example, determines two pieces he values to be $1/3$ each, the third one then must have the same value. In Step 2, if $v_2(S_1) > v_2(S_2)$, then p_2 makes one evaluation when he determines a subpiece of S_1 he values to be equal to $v_2(S_2)$. In Step 3, if $R \neq \emptyset$, then p_3 makes three evaluations in order to find out which of the pieces S'_1, S_2, and S_3 is of highest value to her—here, only two evaluations do not suffice.	notice that, after p_1's two cut requests in Step 1, p_2 makes two evaluation requests to determine $v_2(S_1)$ and $v_2(S_2)$ (and thus knows $v_2(S_3) = 1 - v_2(S_1) - v_2(S_2)$). In Step 2, if $v_2(S_1) > v_2(S_2)$, then p_2 makes one cut request to determine a subpiece S'_1 of S_1 he values to be equal to $v_2(S_2)$ and he also knows $v_2(R) = v_2(S_1) - v_2(S_2)$. In Step 3, p_3 makes three evaluation requests in order to find out which of the pieces S'_1, S_2, and S_3 is of highest value to her—here, only two evaluation requests do not suffice if $R \neq \emptyset$—and p_3 now also knows $v_3(R) = 1 - v_3(S'_1) - v_3(S_2) - v_3(S_3)$.
Page 453, line −4 through page 454, line 4	p_B makes three evaluations in order to partition R into three pieces of equal value—again, only two evaluations do not suffice here, since p_B needs to know the value $v_B(R)$ first before being able to determine two pieces of value $(1/3) \cdot v_B(R)$. Note that p_B knows the value $v_B(R) = v_2(R)$ already from Step 2 and might save this one evaluation only if $p_B = p_2$; but not if $p_B = p_3$. Finally, p_A makes three and p_1 makes two evaluations to choose a most valuable one among the pieces R_1, R_2, and R_3 for themselves. Summing up, we have at most 16 evaluations.	p_B (which is either p_2 or p_3, who both know their own value of R) makes two cut requests in order to partition R into three pieces R_1, R_2, and R_3, each of value $(1/3) \cdot v_B(R)$. Finally, both p_A (which again is either p_2 or p_3, distinct from p_B, and so knows $v_A(R)$) and p_1 make two evaluation requests (p_A to choose a most valuable one among the pieces R_1, R_2, and R_3 and p_1 to choose a most valuable one among the two remaining pieces), and p_B takes the last remaining piece. Summing up, we have at most five cut and at most nine evaluation requests.
Page 458, lines 20–21	the two halves of R his knife currently divides	S and T

Errata in Chapter 8: Fair Division of Indivisible Goods

Jérôme Lang · Jörg Rothe

Location	Original text	Corrected text
Page 502, line −4	More generally, if we have m goods and a ranking over singletons (say, without loss of generality, $r_1 \succ r_2 \succ \cdots \succ r_m$), the *monotonic and separable extension* of $\succ$ on 2^R is the partial order defined as follows: For all $S,T \subseteq R$, $S \succ T$ if and only if there exists an injective mapping σ from T to S such that for every $t \in T$, we have $\sigma(t) \succ t$.	More generally, if we have m goods and a ranking over singletons (say, without loss of generality, $r_1 \succeq r_2 \succeq \cdots \succeq r_m$), the *monotonic and separable extension* of $\succeq$ on 2^R is the partial order defined as follows: For all $S,T \subseteq R$, $S \succeq T$ if and only if there exists an injective mapping σ from T to S such that for every $t \in T$, we have $\sigma(t) \succeq t$.
Page 508, line 16	$u_\Phi(S) = \sum \{w_i \mid S \models \varphi_i\}$,	$u_\Phi(S) = \sum_{i : S \models \varphi_i} w_i$,
Page 511, lines −11 through −8	π satisfies the max-min fair share criterion if and only if for all $i \in A$, there exists some π' such that for all $j \in A$, we have $\pi_i \succ_i \pi'_j$, and π satisfies the min-max fair share criterion if and only if for all $i \in A$ and for all π', there is some $j \in A$ such that $\pi_i \succ_i \pi'_j$.	π satisfies the max-min fair share criterion if and only if for all $i \in A$ and for all π', there exists some $j \in A$ such that $\pi_i \succeq_i \pi'_j$, and π satisfies the min-max fair share criterion if and only if for all $i \in A$, there exists some π' such that for all $j \in A$, we have $\pi_i \succeq_i \pi'_j$.
Page 512, lines −13 and −12	let the agents' utility functions, u_1 and u_2, be defined as	let the agents' additive utility functions, u_1 and u_2, be defined by their utilities for single objects:
Page 515, lines −6 and −5	u_1, u_2, u_3, and u_4 be defined as	let the agents' additive utility functions, $u_1, \ldots, u_4$, be defined by their utilities for single objects:
Page 519, lines 1–2	how much information bits	how many information bits
Page 532, line −15	receiving $\emptyset$ and $v(S)$	receiving $\emptyset$ and $v_i(S)$