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%
% Written by:
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% Please send comments and especially bug reports to the
% above email address.
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% the number of experiments:
N_EXPS = 100;
%N_EXPS = 1000;

% the number of learning episodes (for complete learning this would need to be much
larger):
nEpisodes = 20;

% the number of non-terminal states in this Markov chain:
n_rw_states = 5;

% the true solution:
Vtruth = 0.5 + (0.1:0.1:0.5);

% a vector of learning parameters with 0.0 and 1.0
%alphaV = linspace( 0, 0.6, 10 );
alphaV = linspace( 0, 0.6, 100 );

lambda = 0.9;

results_acc=zeros(length(alphaV),N_EXPS);
results_rep=zeros(length(alphaV),N_EXPS);
fprintf('working on experiment number (of %d): ',N_EXPS);
for ei=1:N_EXPS,
    if( mod(ei,10)==0 ) fprintf('%d, ',ei); end
    for ai=1:length(alphaV),
        a = alphaV(ai);
        %fprintf('working on alpha=%f...\n',a);
        V_w_at = eg_7_5_learn_at( lam, a, n_rw_states, nEpisodes );
        results_acc(ai,ei) = sqrt( mean( (V_w_at-Vtruth).^2 ) );
        V_w_rp = eg_7_5_learn_rt( lam, a, n_rw_states, nEpisodes );
        results_rep(ai,ei) = sqrt( mean( (V_w_rp-Vtruth).^2 ) );
    end
end
fprintf('\n');
results_acc = mean( results_acc, 2 );
results_rep = mean( results_rep, 2 );

figure; hold on;
ph1=plot( alphaV, results_acc, '-xr' ); hold on;
ph2=plot( alphaV, results_rep, '-og' ); grid on;
xlabel( 'alpha' ); ylabel( ['average rms error from ',num2str(nEpisodes), ' episodes'] );
legend( [ph1,ph2], {'Accumulating Traces','Replacing Traces'}, 'Location', 'Best' );
axis( [ 0.0, alphaV(end), 0.0, 1 ] );

saveas(gcf,['./eg_7_5_results_',num2str(N_EXPS)],'png');

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return;
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