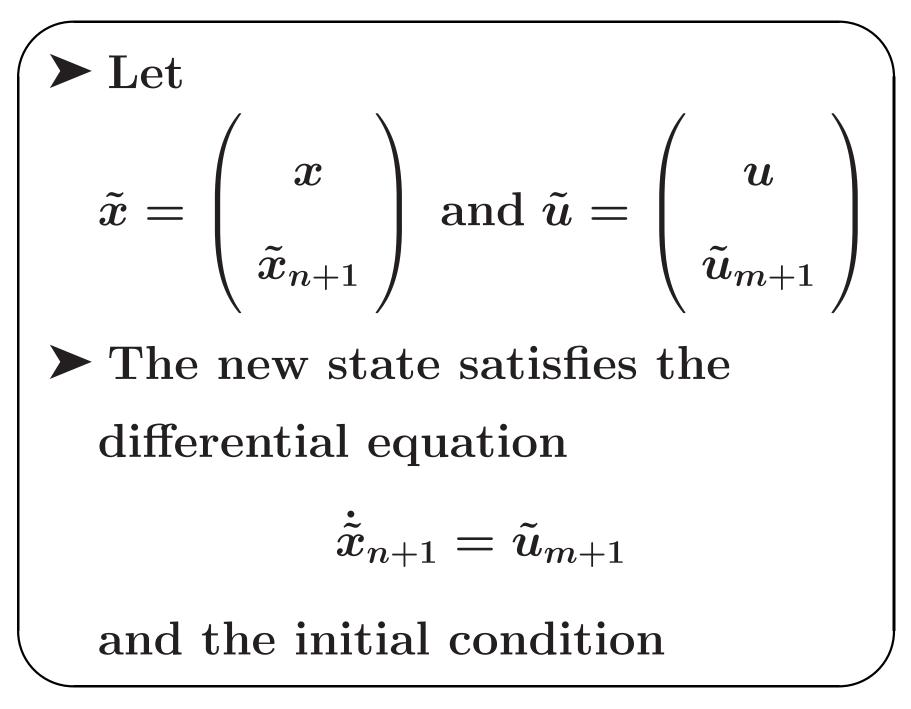
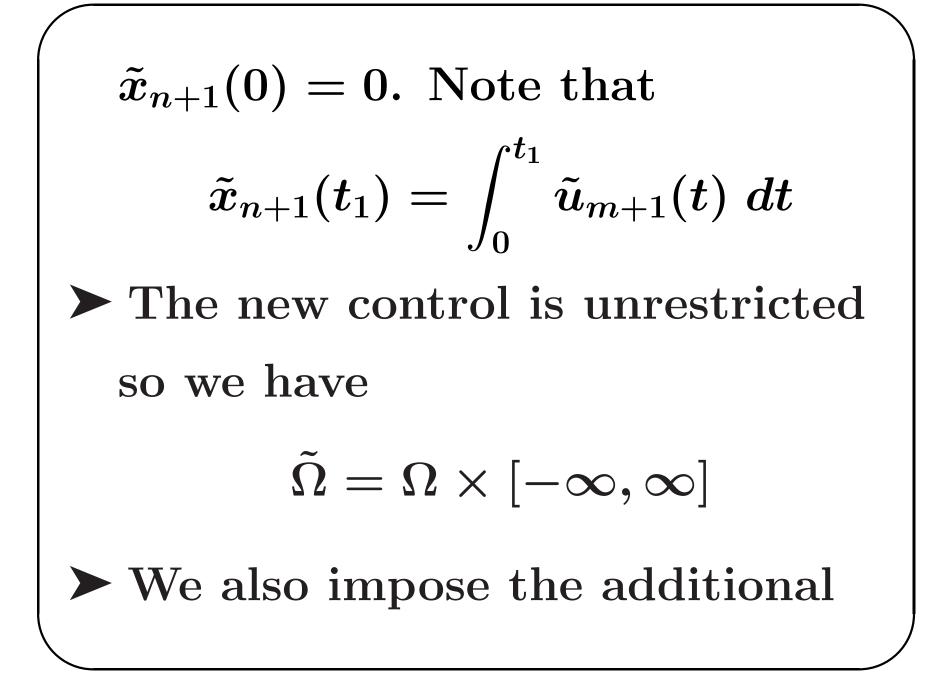
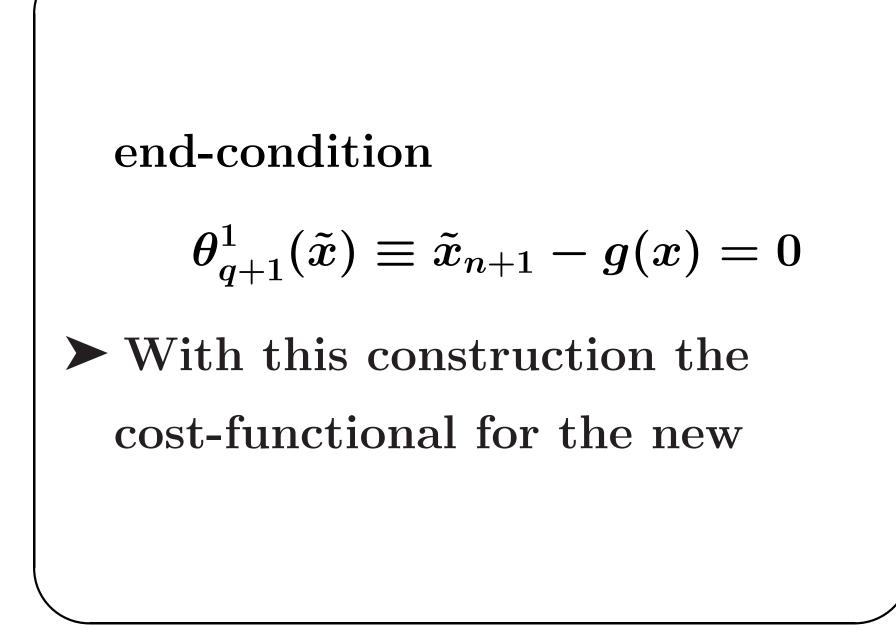


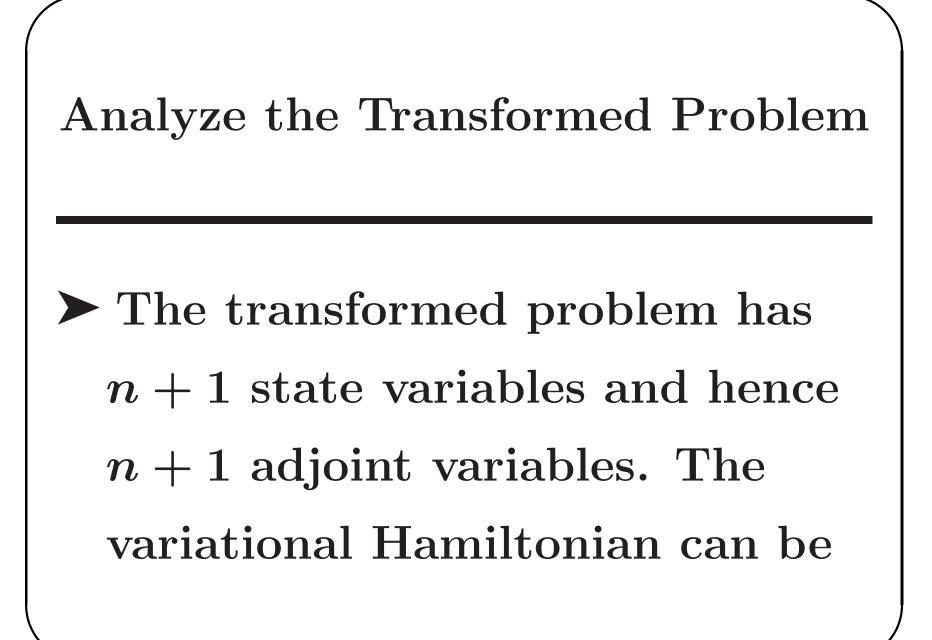
justify these modifications our approach is to transform the new problem (with a Bolza cost functional) to the original form (with a Lagrange cost functional). To carry this our we will augment the state and control vectors.







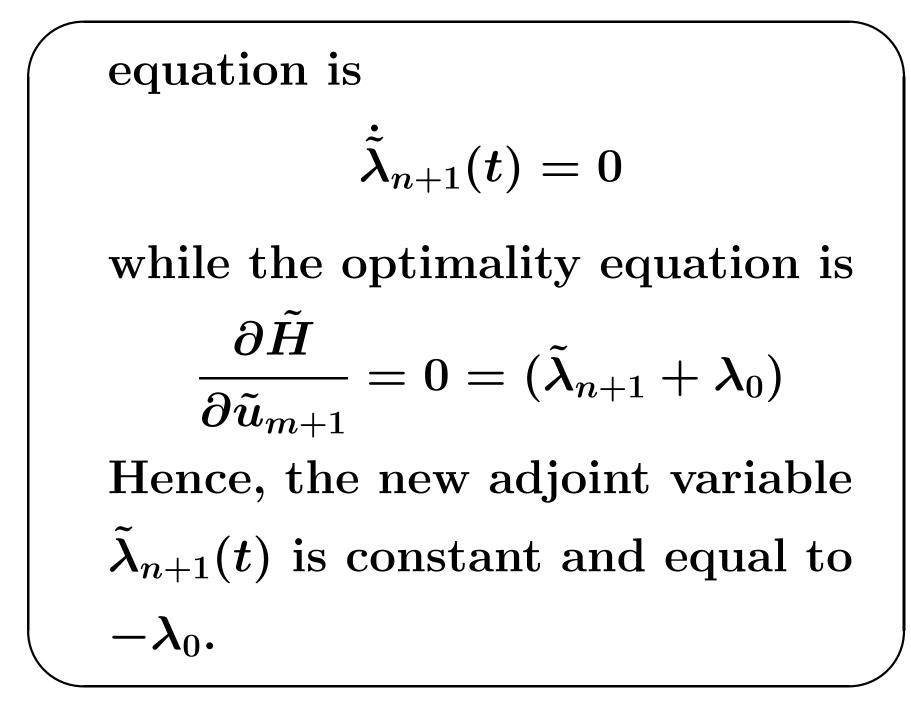
problem can be written as  $\widetilde{J}(\widetilde{u}(\cdot),\widetilde{x}(\cdot))\equiv$  $\int_{0}^{\tilde{i}_{1}} \left[ f_{o}(x(t), u(t)) + ilde{u}_{m+1}(t) 
ight] \, dt _{ ilde{f}_{o}( ilde{x}(t), ilde{u}(t))}$ 

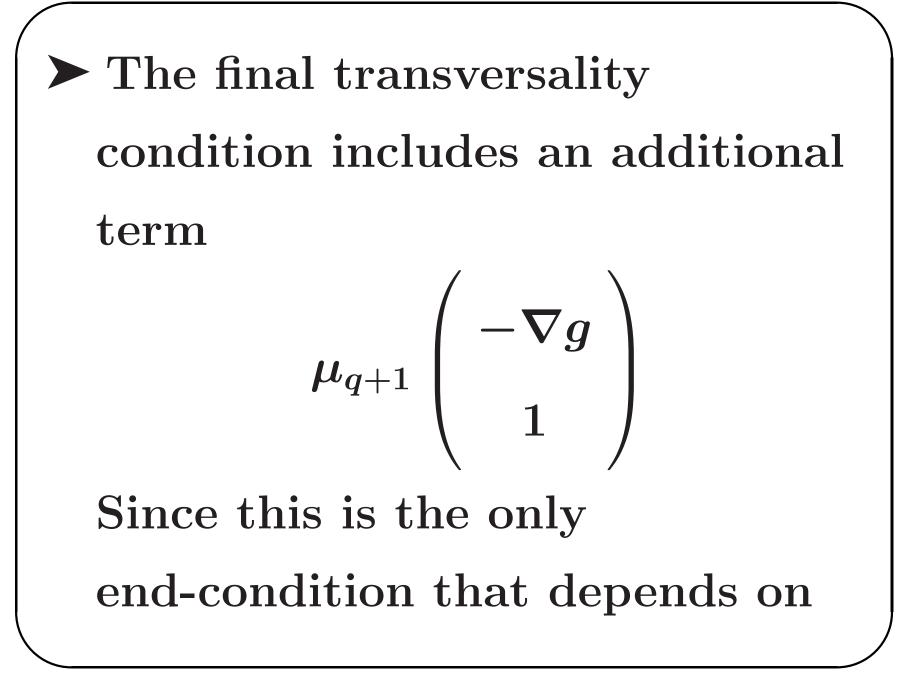


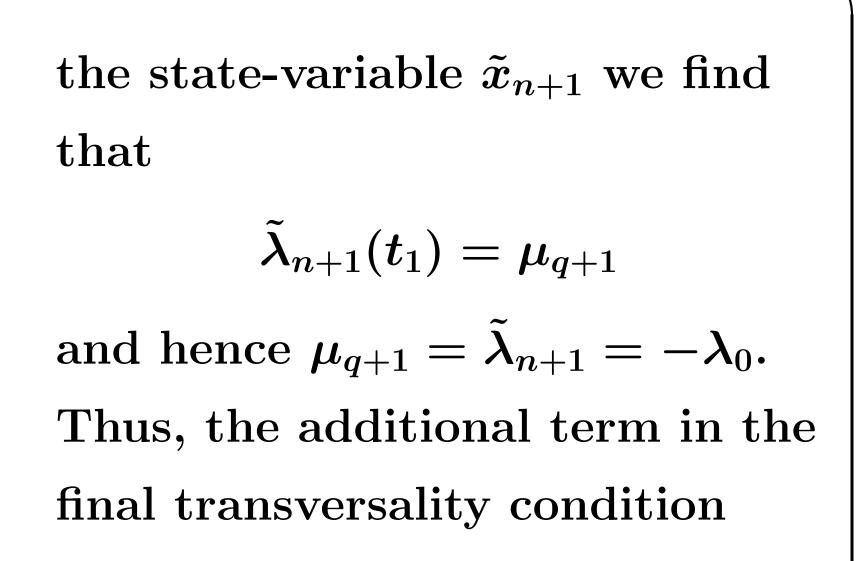
## written as

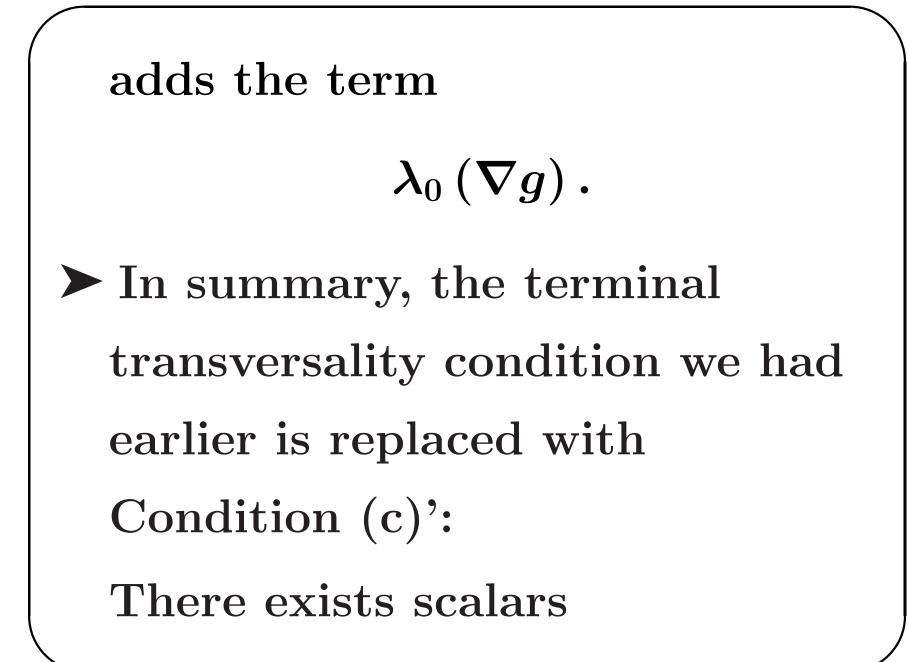
$$egin{aligned} ilde{H}( ilde{\lambda}, ilde{x}, ilde{u}) &= H(\lambda,x,u) + \ & ( ilde{\lambda}_{n+1}+\lambda_0) ilde{u}_{m+1} \end{aligned}$$

It's clear that the adjoint differential equations for the first n components of λ are unaltered. The final adjoint









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 $\mu_i, \quad i=1,\ldots,q \text{ such that:}$  $\lambda(t_1) = \lambda_0 
abla g(x) +$  $\mu_1 \nabla \theta_1(x) + \ldots \mu_q \nabla \theta_q(x)$